

# B & B

B & B MOTOR AND CONTROL CORP. 96 SPRING STREET, NEW YORK, N. Y. 10012, (212) 966-5777

Bodine Motors  
Heller Variable Speed Motors and Controls  
Viscount Tachometer Generator Feedback Systems  
Speed Indicators and Counters  
A. T. C. Timers and Counters  
Geartronics Multi-speed synchronous motors  
Simplatrol Clutches and Brakes

## ABBREVIATIONS

ARM.—Armature  
BK. MOTOR—Motor with electrical brake attached  
BB—Ball Bearing  
CAP—Capacitor  
COMP—Compound  
CW—Clockwise (viewing Shaft End)  
CCW—Counter-Clockwise (viewing Shaft End)  
C-R—Capacitor run. Reversible  
C-R-DB—Capacitor run. Reversible. Dynamic Brake  
D.E. SHAFT—Double End Shaft  
DP—Drip Proof  
DYN—Dynamic  
EX-PROOF—Explosion Proof  
" SHAFT—Diameter of Shaft in Inches  
FC—Fan Cooled  
FL. MT.—Flange Mount  
HY or HYST.—Hysteresis  
INT.—Intermittent

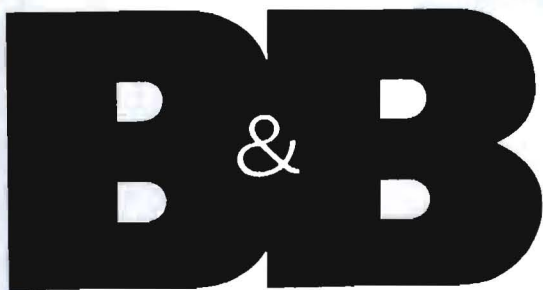
NON-REV—Non-reversible  
NCH—Hysteresis, Synchronous Capacitor. Reversible CPS 115 V 60 cy. Self ventilated  
NCI—Capacitor 4 Lead Reversible. Self-ventilated  
NPP—3-phase 220/440 V 60 cy. Totally enclosed Oil Resistant Leads  
NSE—Series Wound Universal (DC or AC)  
NSH—Shunt Wound (DC)  
NSI—Split Phase, Reversible  
NSY—Synchronous, Split Phase, Reversible  
NYC—Synchronous Capacitor. 4 Lead. Reversible  
OBB—Open Ball Bearing  
OSB—Open Sleeve Bearing  
PAR—Parallel Drive Gear Motor  
RD. BODY—Round Body  
R.A.—Right Angle Drive Geared Motor  
REP.-IND.—Repulsion—Induction  
RES. MT.—Resilient Mount

REV—Reversible  
1 PH—Single Phase  
SB—Sleeve Bearing  
SH—Shaded  
SYN—Synchronous  
TE—Totally Enclosed  
TEBB—Totally Enclosed Ball Bearing  
TEFC—Totally Enclosed Fan Cooled  
TENV—Totally Enclosed, Non Ventilating  
TESB—Totally Enclosed Sleeve Bearing  
T.O.—Thermal Overload Protection  
USI—Split Phase 115 V 60 cy. Self Ventilated. Reversible  
VERT. DOWN—Vertical Gearmotor, Shaft Down  
V—Series Wound Universal (DC or AC)  
3/60—3 Phase, 60 Cycle  
3/50/60—3 Phase, 50 or 60 Cycles  
1/60—Single Phase, 60 Cycles  
1/50—Single Phase, 50 Cycles

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MOTOR  
& CONTROL  
CORP.

96 SPRING ST.  
N.Y., N.Y. 10012

212-966-5777

This is the catalog you requested --

This 1965 edition of the B & B Motor and Control catalog lists the world's largest assortment of motors -- gear and non-gear -- from 1/2000 to 2 hp, from .7 to 10,000 rpm -- all available for immediate, off-the-shelf delivery.

Also listed are complete lines of Variable Speed Motors and Controls ... Tachometer Feedback Systems ... Chronometric Speed Counters ... Electro-magnetic Clutches and Brakes ... Printed Motors and Controllers ... Tachometer Generator Indicating Systems ... Timers ... Rectifiers and Transformers. All for immediate delivery.

If your particular requirements are not listed in this catalog -- we can supply a motor and/or control that will. For additional information, technical guidance, or for a specially designed motor and control system, B & B's engineering assistance is available to you.

Cordially,

A handwritten signature in cursive script, reading 'Paul A. Berson'.

Paul A. Berson

Bodine—sub-fractional and fractional horsepower geared and non-geared motors  
Heller—variable speed controls  
B&B "Viscount"—tachometer generator systems  
Simplatrol—electromagnetic clutches and brakes  
Speed-mate—variable speed drives  
A.T.C.—timers and counters

HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/2000 HORSEPOWER								
1/2000	.7	110"OZ.	115V AC CAP-REV. TEBB DB	KCI	22RC	BODINE	B8262E-1800C	\$32.86
1/2000	.7	120"OZ.	115V AC CAP-REV. TEBB DB	KCI	22RM	BODINE	B8262E-1800M	\$37.32
1/2000	1	110"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	22RC	BODINE	B8122E-1800C	\$32.86
1/2000	1	120"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	22RM	BODINE	B8122E-1800M	\$37.32
1/2000	1.1	105"OZ.	115V AC CAP-REV. TEBB	KCI	22RC	BODINE	B8262E-1200C	\$32.86
1/2000	1.4	95"OZ.	115V AC CAP-REV. TEBB DB	KCI	22RC	BODINE	B8262E-900C	\$32.86
1/2000	1.4	100"OZ.	115V AC CAP-REV. TEBB DB	KCI	22RM	BODINE	B8262E-900M	\$37.32
1/2000	1.5	105"OZ.	115V AC SYN-CAP-REV. TEBB.	KYC	22RC	BODINE	B8122E-1200C	\$32.86
1/2000	2	95"OZ.	115V AC SYN-CAP-REV. TEBB.	KYC	22RC	BODINE	B8122E-900C	\$32.86
1/2000	2	100"OZ.	115V AC SYN-CAP-REV. TEBB.	KYC	22RM	BODINE	B8122E-900M	\$37.32
1/2000	2.1	85"OZ.	115V AC CAP-REV. TEBB DB	KCI	22RC	BODINE	B8262E-600C	\$32.86
1/2000	2.1	95"OZ.	115V AC CAP-REV. TEBB DB	KCI	22RM	BODINE	B8262E-600M	\$37.32
1/2000	3	85"OZ.	115V AC SYN-CAP-REV. TEBB.	KYC	22RC	BODINE	B8122E-600C	\$32.86
1/2000	3	95"OZ.	115V AC SYN-CAP-REV. TEBB.	KYC	22RM	BODINE	B8122E-600M	\$37.32
1/2000	4.1	75"OZ.	115V AC CAP-REV. TEBB DB	KCI	22RC	BODINE	B8262E-300C	\$32.86
1/2000	4.1	81"OZ.	115V AC CAP-REV. TEBB DB	KCI	22RM	BODINE	B8262E-300M	\$37.32
1/2000	6	54"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	22RC	BODINE	B8122E-300C	\$32.86
1/2000	6	95"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	22RM	BODINE	B8130E-300M	\$39.55
1/2000	7	49"OZ.	115V AC CAP-REV. TEBB DB	KCI	22RC	BODINE	B8262E-180C	\$32.86
1/2000	10	32"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	22RC	BODINE	B8122E-180C	\$32.86
1/2000	10	32"OZ.	115V AC CAP-REV. TEBB DB	KCI	22RC	BODINE	B8262E-120C	\$32.86
1/2000	10	65"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	26RM	BODINE	B8130E-180M	\$39.55
1/2000	15	21"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	22RC	BODINE	B8122E-120C	\$32.86
1/2000	15	43"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	26RM	BODINE	B8130E-120M	\$39.55
1/2000	17	18"OZ.	115V AC CAP-REV. TEBB DB	KCI	22RC	BODINE	B8262E-72C	\$32.86
1/2000	25	12"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	22RC	BODINE	B8122E-72C	\$32.86
1/2000	25	26"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	26RM	BODINE	B8130E-72M	\$39.55
1/1500 HORSEPOWER								
1/1500	40	10"OZ.	115V AC CAP-REV. DYN-BRAKE TEBB	KCI	23RB	BODINE	B8264E-30B	\$28.07
1/1500	40	12"OZ.	115V AC CAP-REV. DYN-BRAKE TEBB	KCI	23RM	BODINE	B8264E-30M	\$37.32
1/1500	60	6.6"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	23RB	BODINE	B8124E-30B	\$28.07
1/1500	67	6"OZ.	115V AC CAP-REV. TEBB DB	KCI	23RB	BODINE	B8264E-18B	\$28.07
1/1500	100	4"OZ.	115V AC CAP-REV. TEBB DB	KCI	23RB	BODINE	B8264E-12B	\$28.07
1/1500	100	4"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	23RB	BODINE	B8124E-18B	\$28.07
1/1500	150	2.6"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	23RB	BODINE	B8124E-12B	\$28.07
1/1500	200	2"OZ.	115V AC CAP-REV. TEBB DB	KCI	23RB	BODINE	B8264E-06B	\$28.07
1/1500	200	2"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	23RB	BODINE	B8124E-09B	\$28.07
1/1500	300	1.3"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	23RB	BODINE	B8124E-06B	\$28.07
1/1500	1800	.35"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	23	BODINE	B8124E	\$20.61
1/1500	3600	.18"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	23	BODINE	B8138E	\$24.40

**MOTORS—BODINE,  
G. E., WESTINGHOUSE,  
MASTER,  
"PMI" PRINTED  
MOTOR**

1/2000 to 2 H.P.  
geared and non-  
geared, parallel and  
right angle drive. All  
standard and most  
specials ready for

immediate delivery.

Thousands in stock.

**ELECTRONIC  
VARIABLE SPEED  
DRIVE - HELLER**

Electronic controls for  
D.C. Motors. Provides  
infinite speed control  
of D.C. motors  
through wide speed  
ranges. Many

control and regulation  
features.

**ELECTRO-MAGNETIC  
BRAKES,  
CLUTCHES AND  
COMBINATIONS -  
SIMPLATROL**

Brakes, clutches,  
clutch-brakes, duplex  
clutches, clutch coup-  
plings, combination

couplings.

**MECHANICAL  
VARIABLE SPEED  
DRIVES: SPEED-MATE,  
ZERO-MAX.**

Mechanical variable  
stepless motor speed  
control

**GEARTRONICS—**

Multi-speed syn-

chronous motors and  
multi-ratio gear  
reducers.

**TIMERS - ATC**

Interval timers,  
counters, elapsed  
time indicators, per-  
centage timers,  
impulse counter  
delay timers

**SPEED COUNTING  
SYSTEMS**

Hand held counters,  
Vis-count tachometer  
generator and meter  
read out systems

**RECTIFIER  
COMPONENTS**

Silicon and selenium  
rectifiers. Transfor-  
mers, chokes.





HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/1000 HORSEPOWER								
1/1000	.9	110"OZ.	115V AC CAP-REV. TEBB	KCI	22RC	BODINE	B8192E-1800C	\$32.86
1/1000	.9	120"OZ.	115V AC CAP-REV. TEBB	KCI	22RM	BODINE	B8192E-1800M	\$37.32
1/1000	1.4	105"OZ.	115V AC CAP-REV. TEBB	KCI	22RC	BODINE	B8192E-1200C	\$32.86
1/1000	1.9	95"OZ.	115V AC CAP-REV. TEBB	KCI	22RC	BODINE	B8192E-900C	\$32.86
1/1000	1.9	100"OZ.	115V AC CAP-REV. TEBB	KCI	22RM	BODINE	B8192E-900M	\$37.32
1/1000	2.8	95"OZ.	115V AC CAP-REV. TEBB	KCI	22RM	BODINE	B8192E-600M	\$37.32
1/1000	5.7	75"OZ.	115V AC CAP-REV. TEBB	KCI	22RC	BODINE	B8192E-300C	\$32.86
1/1000	5.7	95"OZ.	115V AC CAP-REV. TEBB	KCI	22RM	BODINE	B8192E-300M	\$37.32
1/1000	9.3	70"OZ.	115V AC CAP-REV. TEBB	KCI	22RC	BODINE	B8192E-180C	\$32.86
1/1000	14	46"OZ.	115V AC CAP-REV. TEBB	KCI	22RC	BODINE	B8192E-120C	\$32.86
1/1000	23	26"OZ.	115V AC CAP-REV. TEBB	KCI	22RC	BODINE	B8192E-72C	\$32.86
1/1000	1800	.6"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	26	BODINE	B8130E	\$22.84
1/1000	3600	.3"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	26	BODINE	B8144E	\$26.62

1/750 HORSEPOWER								
1/750	7	65"OZ.	115V AC CAP-REV. DYN-BRAKE TEBB	KCI	23RM	BODINE	B8264E-180M	\$37.32
1/750	9.3	93"OZ.	115V AC CAP-REV. TEBB	KCI	23RM	BODINE	B8194E-180M	\$37.32
1/750	10	43"OZ.	115V AC CAP-REV. TEBB	KCI	23RM	BODINE	B8264E-120M	\$37.32
1/750	14	62"OZ.	115V AC CAP-REV. TEBB DB	KCI	23RM	BODINE	B8194E-120M	\$37.32
1/750	23	37"OZ.	115V AC CAP-REV. TEBB	KCI	23RM	BODINE	B8194E-72M	\$37.32
1/750	56	14"OZ.	115V AC CAP-REV. TEBB	KCI	23RB	BODINE	B8194E-30B	\$28.07
1/750	56	18"OZ.	115V AC CAP-REV. TEBB	KCI	23RM	BODINE	B8194E-30M	\$37.32
1/750	67	14"OZ.	115V AC CAP-REV. TEBB	KCI	26RM	BODINE	B8270E-18M	\$39.55
1/750	93	8.6"OZ.	115V AC CAP-REV. TEBB DB	KCI	23RB	BODINE	B8194E-18B	\$28.07
1/750	140	5.7"OZ.	115V AC CAP-REV. TEBB	KCI	23RB	BODINE	B8194E-12B	\$28.07
1/750	200	5.2"OZ.	115V AC CAP-REV. TEBB	KCI	26RM	BODINE	B8270E-06M	\$39.55
1/750	280	2.8"OZ.	115V AC CAP-REV. TEBB DB	KCI	23RB	BODINE	B8194E-06B	\$28.07
1/750	1200	1.1"OZ.	115V AC CAP-REV. TEBB	KCI	23	BODINE	B8264E	\$20.61
1/750	1550	1.4"OZ.	115V AC CAP-REV. TEBB	KCI	23	BODINE	B8194E	\$20.61

1/500 HORSEPOWER								
1/500	60	10"OZ.	115V AC SYN-CAP-REV. TEBB	KYC	26RB	BODINE	B8130E-30B	\$40.00
1/500	93	16"OZ.	115V AC CAP-REV. TEBB	KCI	26RM	BODINE	B8200E-18M	\$39.55
1/500	140	10"OZ.	115V AC CAP-REV. TEBB	KCI	26RM	BODINE	B8200E-12M	\$39.55
1/500	280	5.7"OZ.	115V AC CAP-REV. TEBB	KCI	26RM	BODINE	B8200E-06M	\$39.55
1/500	1200	1.8"OZ.	115V AC CAP-REV. TEBB	KCI	26	BODINE	B8270E	\$22.84
1/500	1550	2.4"OZ.	115V AC CAP-REV. TEBB	KCI	26	BODINE	B8200E	\$22.84

1/350 HORSEPOWER								
1/350	100	28"OZ.	115V DC R.A. 1/8" SH. TEBB	D7	M107	B & B	M107D7	\$51.00
1/350	100	28"OZ.	24V DC 2-WIRE R.A. 1/8" SH. TEBB	E6	M107	B & B	M107E6	\$51.00

PRICES ARE FOR SINGLE UNIT ORDERS, QUANTITY DISCOUNTS ARE AVAILABLE • ALL MOTORS ARE GUARANTEED FOR A FULL YEAR • NOT ALL ITEMS ARE LISTED, CONTACT COMPANY FOR LATEST INFORMATION • NEW ITEMS ARE ADDED TO STOCK DAILY • 24-HOUR DELIVERY • ALL ITEMS AVAILABLE FROM STOCK • FREE TECHNICAL AND ENGINEERING ASSISTANCE • WHEN ORDERING, PLEASE SPECIFY SHIPPING INSTRUCTIONS • COMPLETE REPAIR SERVICE.



HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/150 HORSEPOWER								
1/150	1.3	37"LBS.	230V 1/60 SP-PHASE REV OBB	NSI	12RG	BODINE	B7095-1350G	\$83.90
1/150	1.3	37"LBS.	220V AC 3 PH. OBB	NPP	12RG	BODINE	B7099-1350G	\$97.60
1/150	1.3	37"LBS.	115V AC SPIT PHASE REV. OBB	NSI	12RG	BODINE	B7094-1350G	\$74.29
1/150	1.3	37"LBS.	115V DC SHUNT OBB	NSH	12RG	BODINE	B7096-1350G	\$80.50
1/150	1.33	37"LBS.	220V 3 PH. SYNCHRONOUS OBB	NYP	12RG	BODINE	B7087-1350G	\$108.00
1/150	1.6	40"LBS.	115V AC SPLIT PHASE REV. OBB	NSI	12RG	BODINE	B7094-1080G	\$44.78
1/150	1.6	40"LBS.	230V 1/60 SP PHASE REV. OBB	NSI	12RG	BODINE	B7095-1080G	\$81.87
1/150	1.6	40"LBS.	115V AC CAP REV. OBB	NCI	12RG	BODINE	B7112-1080G	\$50.07
1/150	1.6	40"LBS.	115V DC SHUNT OBB	NSH	12RG	BODINE	B7096-1080G	\$65.00
1/150	1.66	38"LBS.	220V 3 PH SYNCHRONOUS OBB	NYP	12RG	BODINE	B7094-900G	\$102.42
1/150	1.9	35"LBS.	115V D.C. SHUNT OBB	NSH	12RG	BODINE	B7096-900G	\$80.50
1/150	1.9	2.1"LBS.	220V 3 PHASE SYN. TEBB	NYP	12R	BODINE	B2127E-900	\$90.82
1/150	2	34"LBS.	220V 3 PH. SYNCHRONOUS OBB	NYP	12RG	BODINE	B7087-900G	\$102.42
1/150	2.1	32"LBS.	115V AC SP-PHASE REV. OBB	NSI	12RG	BODINE	B7094-810G	\$74.29
1/150	2.1	32"LBS.	115V DC SHUNT OBB	NSH	12RG	BODINE	B7096-810G	\$80.50
1/150	10	7"LBS.	220V 3 PH. SYNCHRONOUS TEBB	NYP	12R	BODINE	B2127E-180	\$90.82
1/150	25	6.7"LBS.	220V 3 PH. SYNCHRONOUS TEBB	NYP	12R	BODINE	B2127E-72	\$90.82
1/150	30	6.1"LBS.	220V 3 PH. SYNCHRONOUS TEBB	NYP	12R	BODINE	B2127E-60	\$90.82
1/150	60	3.5"LBS.	220V 3 PH. SYNCHRONOUS TEBB	NYP	12R	BODINE	B2127E-30	\$87.93
1/150	50	4.2"LBS.	220V 3 PH. SYNCHRONOUS TEBB	NYP	12R	BODINE	B2127E-36	\$90.82
1/150	75	2.9"LBS.	220V 3 PH. SYNCHRONOUS TEBB	NYP	12R	BODINE	B2127E-24	\$87.93
1/150	100	2.4"LBS.	220V 3 PH. SYNCHRONOUS TEBB	NYP	12R	BODINE	B2127E-18	\$87.93
1/150	300	1.0"LBS.	220V 3 PH. SYNCHRONOUS TEBB	NYP	12R	BODINE	B2127E-06	\$87.93
1/125 HORSEPOWER								
1/125	1.33	37"LBS.	115V AC SYNCHRONOUS SP-PH REV.	NSY	12RG	BODINE	B7078-1350G	\$81.31
1/125	1.66	42"LBS.	115V AC SYNCHRONOUS SP-PH REV.	NSY	12RG	BODINE	B7078-1080G	\$92.52
1/125	2	2.1"LBS.	115V AC SYN-SP-PHASE REV. TEBB	NSY	12R	BODINE	B2246E-900	\$43.56
1/125	2	2.1"LBS.	115V AC SYN-CAP REV. TEBB	NYC	12R	BODINE	B2270E-900	\$48.85
1/125	10	7"LBS.	115V AC SYN-SP-PHASE REV. TEBB	NSY	12R	BODINE	B2246E-180	\$43.56
1/125	10	7"LBS.	115V AC SYN-CAP REV. TEBB	NYC	12R	BODINE	B2270E-180	\$48.85
1/125	25	6.7"LBS.	115V AC SYN-SP-PHASE REV. TEBB	NSY	12R	BODINE	B2246E-72	\$43.56
1/125	30	6.1"LBS.	115V AC SYN-SP-PHASE REV. TEBB	NSY	12R	BODINE	B2246E-60	\$43.56
1/125	50	4.2"LBS.	115V AC SYN-SP-PHASE REV. TEBB	NSY	12R	BODINE	B2246E-36	\$43.56
1/125	60	3.5"LBS.	115V AC SYN-SP-PHASE REV. TEBB	NSY	12R	BODINE	B2246E-30	\$41.16
1/125	60	3.5"LBS.	115V AC SYN-CAP REV. TEBB	NYC	12R	BODINE	B2270E-30	\$46.35
1/125	75	3.5"LBS.	115V AC SYN-SP-PHASE REV. TEBB	NSY	12R	BODINE	B2246E-24	\$41.16
1/125	100	2.9"LBS.	115V AC SYN-SP-PHASE REV. TEBB	NSY	12R	BODINE	B2246E-18	\$41.16
1/125	100	2.9"LBS.	115V AC SYN-CAP REV. TEBB	NYC	12R	BODINE	B2270E-18	\$46.35
1/125	150	1.8"LBS.	220V 3 PH. SYNCHRONOUS TEBB	NYP	12R	BODINE	B2127E-12	\$87.93
1/125	150	1.8"LBS.	115V AC SYN-SP-PHASE REV. TEBB	NSY	12R	BODINE	B2246E-12	\$41.16
1/125	180	1.6"LBS.	220V AC 3/60 SYN. TEBB	NYP	12R	BODINE	B2127E-10	\$87.93
1/125	180	1.9"LBS.	115V AC SYNCHRONOUS CAP REV. TEBB	NYC	12R	BODINE	B2270E-10	\$46.35

THOUSANDS OF OTHER STANDARD MOTORS  
THAT COULDN'T BE INCLUDED  
IN THIS LISTING ARE IN STOCK  
OR  
MOTORS CAN BE MADE TO YOUR  
SPECIAL REQUIREMENTS IN OUR  
EXPERIENCED SHOP.  
ANY  
SPEED, TORQUE, OR VOLTAGE  
THAT YOU WANT





HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/125 HORSEPOWER								
1/125	180	1.9"LBS.	115V AC SYN-SP-PHASE REV. TEBB	NSY	12R	BODINE	B2246E-10	\$41.16
1/125	300	1.2"LBS.	115V AC SYN-SP-PHASE REV. TEBB	NSY	12R	BODINE	B2246E-06	\$41.16
1/125	300	1.2"LBS.	115V AC SYN-CAP REV. TEBB	NYC	12R	BODINE	B2270E-06	\$46.35
1/125	1800	3.75" OZ.	115V AC SYN-SP-PHASE REV. TEBB	NSY	12	BODINE	B2246E	\$28.18
1/100 HORSEPOWER								
1/100	17	64"OZ.	115V AC/DC SERIES WOUND CW OSB	V	10R	BODINE	1610-432	\$22.22
1/100	41	44.8"OZ.	115V AC/DC SERIES WOUND CW OSB	V	10R	BODINE	1610-144	\$22.22
1/100	54	59.2"OZ.	115V AC/DC SERIES WOUND CCW OSB	V	10R	BODINE	1610-100	\$22.22
1/100	208	25.6"OZ.	115V AC/DC SERIES WOUND CCW OSB	V	10R	BODINE	1610-24	\$19.11
1/100	500	12.8"OZ.	115V AC/DC OSB CCW	V	10R	BODINE	1610-10	\$19.11
1/100	1500	7.4"OZ.	115V 50 CYCLES SYNCHRONOUS OBB	NSY	12	BODINE	B5650	\$42.90
1/100	5000	2.01"OZ.	115V AC/DC OSB CCW	V	10	BODINE	1612	\$14.00
1/100	5000	2.01"OZ.	115V AC/DC OSB CW	V10	10	BODINE	1611	\$14.00
1/80 HORSEPOWER								
1/80	1425	8"OZ.	115V AC 1/50 SP-PHASE REV. TEBB	NSI	12	BODINE	B2186E	\$35.88
1/80	1750	8"OZ.	220V AC 3/60 TEBB	NPP	12	BODINE	B2139E	\$52.10
1/75 HORSEPOWER								
1/75	3	50"LBS.	115V AC SYN-PHASE REV. OBB	NSY	12RG	BODINE	B2246-600G	\$50.58
1/75	3	50"LBS.	115V AC SYN-CAP REV.	NYC	12RG	BODINE	B2270-600G	\$55.87
1/75	30	13"LBS.	115V AC SYN-SP-PHASE REV. OBB	NSY	12RG	BODINE	B2246-60G	\$50.58
1/75	30	13"LBS.	115V AC SYN-CAP-REV. OBB	NYC	12RG	BODINE	B2270-60G	\$55.87
1/75	30	8.4"LBS.	220V 3 PH. SYNCHRONOUS OBB	NYP	12RH	BODINE	B2127-60H	\$95.68
1/75	30	8.4"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	12RH	BODINE	B2246-60H	\$84.00
1/75	45	7.5"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	12RH	BODINE	B2246-40H	\$84.00
1/75	60	5.6"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	12RH	BODINE	B2246-30H	\$84.00
1/75	90	4.7"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	12RH	BODINE	B2246-20H	\$84.00
1/75	120	4"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	12RH	BODINE	B2246-15H	\$84.00
1/75	180	3.5"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	12RH	BODINE	B2246-10H	\$84.00
1/75	360	1.75"LBS.	115V AC SYN SP-PHASE REV. OBB	NSY	12RH	BODINE	B2246-05H	\$115.60
1/75	720	.88"LBS.	115V AC SYN SP-PHASE REV. OBB	NSY	12RH	BODINE	B2246-2 1/2H	\$115.60
1/75	1800	7.4"OZ.	115V AC SYN- SP-PHASE REV. OBB	NSY	12	BODINE	B2246	\$28.18
1/75	1800	7.4"OZ.	220V 3 PH. SYNCHRONOUS OBB	NYP	12	BODINE	B2127	\$62.50
1/70 HORSEPOWER								
1/70	1.5	2.2"LBS.	115V DC SHUNT TEBB	NSH	12R	BODINE	B2150E-1120	\$47.89
1/70	1.9	2.1"LBS.	115V AC SP-PHASE REV. TEBB	NSI	12R	BODINE	B2222E-900	\$37.76
1/70	1.9	2.1"LBS.	220V AC 3/60 TEBB	NPP	12R	BODINE	B2139E-900	\$79.23
1/70	1.9	2.1"LBS.	230V AC 1/60 SP-PHASE REV. TEBB	NSI	12R	BODINE	B2223E-900	\$71.30
1/70	2	48"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	12RG	BODINE	B7054-720G	\$63.01
1/70	2.4	48"LBS.	115V AC SP-PHASE REV. OBB	NSI	12RG	BODINE	B7050-720G	\$44.78
1/70	2.4	48"LBS.	220V AC 3/60 OBB	NPP	12RG	BODINE	B7059-720G	\$87.73
1/70	2.4	48"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	12RG	BODINE	B7051-720G	\$81.87
1/70	2.4	48"LBS.	115V DC SHUNT OBB 1/2" SH. DIA.	NSH	12RG	BODINE	B7052-720G	\$80.50
1/70	2.9	3.4"LBS.	115V AC SP-PHASE REV. TEBB	NSI	12R	BODINE	B2222E-600	\$37.76

FOR ALL 11R AND 12R FRAMES WITH GEAR RATIOS OF 6 TO 1, 10 TO 1, 12 TO 1, 18 TO 1, AND 30 TO 1, SEE SINGLE REDUCTION GROUP 1 DIMENSIONS ON PAGE 25. FOR 36 TO 1 RATIO AND HIGHER, SEE DOUBLE REDUCTION GROUP 1. RATIOS ARE THE DIGITS AFTER THE DASH, EXAMPLE: B2222E-18 IS A 18 TO 1 RATIO AND IS A SINGLE REDUCTION, GROUP 1.



HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/70	2.9	3.4"LBS.	115V AC CAP REV. TEBB	NCI	12R	BODINE	B2258E-600	\$43.05
1/70	2.9	3.4"LBS.	220V AC 3/60 TEBB	NPP	12R	BODINE	B2139E-600	\$79.23
1/70	2.9	3.4"LBS.	230V AC 1/60 SP-PHASE REV. TEBB	NSI	12R	BODINE	B2223E-600	\$71.30
1/70	3	52"LBS.	115V AC 1/50 SP-PHASE REV.	NSI	12RG	BODINE	B2186-480G	\$63.00
1/70	3.6	52"LBS.	115V AC SP-PHASE REV. OBB	NSI	12RG	BODINE	B7050-480G	\$44.78
1/70	3.6	52"LBS.	115V AC CAP REV. BB	NCI	12RG	BODINE	B7072-480G	\$50.07
1/70	3.6	52"LBS.	220V AC 3/60 OBB	NPP	12RG	BODINE	B7059-480G	\$87.73
1/70	3.6	52"LBS.	230V AC SP-PHASE REV. 1/2" SH. DIA.	NSI	12RG	BODINE	B7051-480G	\$81.87
1/70	3.6	52"LBS.	115V DC SHUNT OBB	NSH	12RG	BODINE	B7052-480G	\$80.50
1/70	4	5.7"LBS.	115V AC SP-PHASE REV. TEBB	NSI	12R	BODINE	B2222E-432	\$37.76
1/70	4	44"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	12RG	BODINE	B2186-360G	\$63.01
1/70	4	5.7"LBS.	220V AC 3/60 TEBB	NPP	12R	BODINE	B2139E-432	\$79.23
1/70	4	5.7"LBS.	230V AC 1/60 SP-PHASE REV. TEBB	NSI	12R	BODINE	B2223E-432	\$71.30
1/70	4	5.7"LBS.	115V DC SHUNT TEBB 5/16" SH. DIA.	NSH	12R	BODINE	B2150E-432	\$42.89
1/70	4.8	44"LBS.	115V AC SP-PHASE REV. OBB 1/2" SH. DIA.	NSI	12RG	BODINE	B7050-360G	\$44.78
1/70	4.8	44"LBS.	220V AC 3/60 OBB 1/2" SH. DIA.	NPP	12RG	BODINE	B7059-360G	\$87.73
1/70	4.8	44"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	12RG	BODINE	B7051-360G	\$81.87
1/70	4.8	44"LBS.	115V DC SHUNT OBB	NSH	12RG	BODINE	B7052-360G	\$80.50
1/70	5.3	6.6"LBS.	115V DC SHUNT TEBB	NSH	12R	BODINE	B2150E-324	\$42.89
1/70	5.8	39"LBS.	115V AC SP-PHASE REV. OBB	NSI	12RG	BODINE	B7050-300G	\$83.90
1/70	5.8	6.1"LBS.	115V DC SHUNT TEBB	NSH	12R	BODINE	B2150E-300	\$47.89
1/70	6	5.1"LBS.	115V AC SP-PHASE REV. TEBB	NSI	12R	BODINE	B2222E-288	\$37.76
1/70	6	5.1"LBS.	220V AC 3/60 TEBB	NPP	12R	BODINE	B2139E-288	\$79.23
1/70	6	5.1"LBS.	230V AC 1/60 SP-PHASE TE BB	NSI	12R	BODINE	B2223E-288	\$71.30
1/70	9.6	7"LBS.	115V AC SP-PHASE REV. TEBB	NSI	12R	BODINE	B2222E-180	\$37.76
1/70	9.6	7"LBS.	115V AC CAP REV. TEBB	NCI	12R	BODINE	B2258E-180	\$43.05
1/70	9.6	7"LBS.	220V AC 3/60 TEBB	NPP	12R	BODINE	B2139E-180	\$79.23
1/70	9.6	7"LBS.	230V AC 1/60 SP-PHASE REV. TEBB	NSI	12R	BODINE	B2223E-180	\$71.30
1/70	9.6	7"LBS.	115V DC SHUNT TEBB	NSH	12R	BODINE	B2150E-180	\$42.89
1/70	17	5.6"LBS.	115V AC SP-PHASE REV. TEBB	NSI	12R	BODINE	B2222E-100	\$37.76
1/70	17	5.6"LBS.	220V AC 3/60 TEBB	NPP	12R	BODINE	B2139E-100	\$79.23
1/70	17	5.6"LBS.	230V AC 1/60 SP-PHASE REV. TEBB	NSI	12R	BODINE	B2223E-100	\$71.30
1/70	17	5.6"LBS.	115V DC SHUNT TEBB	NSH	12R	BODINE	B2150E-100	\$42.89
1/70	21	13"LBS.	115V AC/DC SERIES WOUND OBB CW	NSE	11RG	BODINE	B7070-240G	\$41.45
1/70	24	6.7"LBS.	115V AC SP-PHASE REV. TEBB	NSI	12R	BODINE	B2222E-72	\$37.76
1/70	24	6.7"LBS.	115V AC CAP REV. TEBB	NCI	12R	BODINE	B2258E-72	\$43.05
1/70	24	6.7"LBS.	220V AC 1/60 CAP REV. TEBB	NCI	12R	BODINE	B2259E-72	\$73.75
1/70	24	6.7"LBS.	220V AC 3/60 TEBB	NPP	12R	BODINE	B2139E-72	\$79.23
1/70	24	6.7"LBS.	230V AC 1/60 SP-PHASE REV. TEBB	NSI	12R	BODINE	B2223E-72	\$71.30
1/70	24	6.7"LBS.	115V DC SHUNT	NSH	12R	BODINE	B2150E-72	\$67.80
1/70	29	8"LBS.	115V AC SP-PHASE REV. TEBB	NSI	12R	BODINE	B2222E-60	\$37.76
1/70	29	8"LBS.	220V AC 3/60 TEBB	NPP	12R	BODINE	B2139E-60	\$79.23
1/70	29	8"LBS.	230V AC 1/60 SP-PHASE REV. TEBB	NSI	12R	BODINE	B2223E-60	\$71.30
1/70	48	7.1"LBS.	115V AC SP-PHASE REV. TEBB	NSI	12R	BODINE	B2222E-36	\$37.76

**MOTORS—BODINE, G. E., WESTINGHOUSE, MASTER, "PMI" PRINTED MOTOR**  
1/2000 to 2 H.P. geared and non-geared, parallel and right angle drive. All standard and most specials ready for

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**ELECTRONIC VARIABLE SPEED DRIVE • HELLER**  
Electronic controls for D.C. Motors. Provides infinite speed control of D.C. motors through wide speed ranges. Many

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Brakes, clutches, clutch-brakes, duplex clutches, clutch couplings, combination

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**MECHANICAL VARIABLE SPEED DRIVES: SPEED-MATE, ZERO-MAX.**  
Mechanical variable stepless motor speed control  
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Interval timers, counters, elapsed time indicators, percentage timers, impulse counter delay timers

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Hand held counters. Vis-count tachometer generator and meter read out systems  
**RECTIFIER COMPONENTS**  
Silicon and selenium rectifiers. Transformers, chokes.





HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/70	48	7.1"LBS.	115V AC CAP REV. TEBB	NCI	12R	BODINE	B2258E-36	\$43.05
1/70	48	7.1"LBS.	220V 3/60 TEBB	NPP	12R	BODINE	B2139E-36	\$79.23
1/70	48	7.1"LBS.	230V AC 1/60 SP-PHASE REV. TEBB	NSI	12R	BODINE	B2223E-36	\$71.30
1/70	48	7.1"LBS.	115V DC SHUNT TEBB	NSH	12R	BODINE	B2150E-36	\$47.89
1/70	58	3.5"LBS.	115V AC SP-PHASE REV. TEBB	NSI	12R	BODINE	B2222E-30	\$35.37
1/70	58	3.5"LBS.	220V AC 3/60 TEBB	NPP	12R	BODINE	B2139E-30	\$76.33
1/70	58	3.5"LBS.	230V AC 1/60 SP-PHASE REV. TEBB	NSI	12R	BODINE	B2223E-30	\$67.00
1/70	58	3.5"LBS.	115V DC SHUNT 5/16" SH. DIA. TEBB	NSH	12R	BODINE	B2150E-30	\$47.89
1/70	72	6.5"LBS.	115V AC SP-PHASE REV. TEBB	NSI	12R	BODINE	B2222E-24	\$35.37
1/70	72	6.5"LBS.	220V AC 3/60 TEBB	NPP	12R	BODINE	B2139E-24	\$76.33
1/70	72	6.5"LBS.	230V AC 1/60 SP-PHASE REV. TEBB	NSI	12R	BODINE	B2223E-24	\$67.00
1/70	96	5.4"LBS.	115V AC SP-PHASE REV. TEBB	NSI	12R	BODINE	B2222E-18	\$35.37
1/70	96	5.4"LBS.	115V AC CAP. REV. TEBB	NCI	12R	BODINE	B2258E-18	\$40.66
1/70	96	5.4"LBS.	220V AC 3/60 TEBB	NPP	12R	BODINE	B2139E-18	\$76.33
1/70	96	5.4"LBS.	230V AC 1/60 SP-PHASE REV. TEBB	NSI	12R	BODINE	B2223E-18	\$67.00
1/70	96	5.4"LBS.	115V DC SHUNT TEBB	NSH	12R	BODINE	B2150E-18	\$40.49
1/70	144	4"LBS.	115V AC SP-PHASE REV. TEBB	NSI	12R	BODINE	B2222E-12	\$35.37
1/70	144	4"LBS.	115V AC CAP REV. TEBB	NCI	12R	BODINE	B2258E-12	\$40.66
1/70	144	4"LBS.	220V AC 3/60 TEBB	NPP	12R	BODINE	B2139E-12	\$76.33
1/70	144	4"LBS.	230V AC 1/60 SP-PHASE REV. TEBB	NSI	12R	BODINE	B2223E-12	\$67.00
1/70	173	3.5"LBS.	115V AC SP-PHASE REV. TEBB	NSI	12R	BODINE	B2222E-10	\$35.37
1/70	173	3.5"LBS.	220V AC 3/60 TEBB	NPP	12R	BODINE	B2139E-10	\$76.33
1/70	173	3.5"LBS.	230V AC 1/60 SP-PHASE REV. TEBB	NSI	12R	BODINE	B2223E-10	\$67.00
1/70	288	2.2"LBS.	115V AC SP-PHASE REV. TEBB	NSI	12R	BODINE	B2222E-06	\$35.37
1/70	288	2.2"LBS.	115V AC CAP REV. TEBB	NCI	12R	BODINE	B2258E-06	\$40.66
1/70	288	2.2"LBS.	220V AC 3/60 TEBB	NPP	12R	BODINE	B2139E-06	\$76.33
1/70	288	2.2"LBS.	230V AC 1/60 SP-PHASE REV. TEBB	NSI	12R	BODINE	B2223E-06	\$67.00
1/70	288	2.2"LBS.	115V DC SHUNT TEBB	NSH	12R	BODINE	B2150E-06	\$47.89
1/70	1750	8"OZ.	115V AC SP-PHASE REV. TEBB	NSI	12	BODINE	B2222E	\$22.39
1/70	1750	8"OZ.	230V AC 1/60 SP-PHASE REV. TEBB	NSI	12	BODINE	B2223E	\$38.40
1/70	1800	7.4"OZ.	115V AC SYN-CAP REV. OBB	NYC	12	BODINE	B2270	\$33.47

## 1/60 HORSEPOWER

1/60	13	1.1"LBS.	115V AC/DC SERIES CW OBB	NSE	11R	BODINE	B2080-768	\$30.13
1/60	27	4"LBS.	115V AC/DC SERIES CW OBB	NSE	11R	BODINE	B2080-324	\$30.13
1/60	39	3.8"LBS.	115V AC/DC SERIES CW OBB	NSE	11R	BODINE	B2080-216	\$30.13
1/60	44	4.5"LBS.	115V AC/DC SERIES CW OBB	NSE	11R	BODINE	B2080-180	\$30.13
1/60	93	4"LBS.	115V AC/DC SERIES CW OBB	NSE	11R	BODINE	B2080-72	\$30.13
1/60	151	3.7"LBS.	115V AC/DC SERIES CW OBB	NSE	11R	BODINE	B2080-36	\$30.13
1/60	226	2.6"LBS.	115V AC/DC SERIES CCW OBB	NSE	11R	BODINE	B2080-24	\$27.24
1/60	301	2.1"LBS.	115V AC/DC SERIES CCW OBB	NSE	11R	BODINE	B2080-18	\$27.24
1/60	453	1.6"LBS.	115V AC/DC SERIES CCW OBB	NSE	11R	BODINE	B2080-12	\$27.24
1/60	543	1.4"LBS.	115V AC/DC SERIES CCW OBB	NSE	11R	BODINE	B2080-10	\$27.24
1/60	905	.9"LBS.	115V AC/DC SERIES CCW OBB	NSE	11R	BODINE	B2080-6	\$27.24

PRICES ARE FOR SINGLE UNIT ORDERS. QUANTITY DISCOUNTS ARE AVAILABLE • ALL MOTORS ARE GUARANTEED FOR A FULL YEAR • NOT ALL ITEMS ARE LISTED, CONTACT COMPANY FOR LATEST INFORMATION • NEW ITEMS ARE ADDED TO STOCK DAILY • 24-HOUR DELIVERY • ALL ITEMS AVAILABLE FROM STOCK • FREE TECHNICAL AND ENGINEERING ASSISTANCE • WHEN ORDERING, PLEASE SPECIFY SHIPPING INSTRUCTIONS • COMPLETE REPAIR SERVICE.



HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/50 HORSEPOWER								
1/50	7.2	47"LBS.	115V AC SP-PHASE REV. OBB	NSI	12RG	BODINE	B2222-240G	\$44.78
1/50	7.2	47"LBS.	220V AC 3/60 OBB	NPP	12RG	BODINE	B2139-240G	\$87.73
1/50	7.2	47"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	12RG	BODINE	B2223-240G	\$83.90
1/50	7.2	47"LBS.	115V DC SHUNT OBB	NSH	12RG	BODINE	B2150-240G	\$49.91
1/50	9.5	41"LBS.	115V AC CAP REV. OBB	NCI	12RG	BODINE	B2258-180G	\$50.07
1/50	9.6	41"LBS.	115V AC SP-PHASE REV. OBB	NSI	12RG	BODINE	B2222-180G	\$44.78
1/50	9.6	41"LBS.	220V AC 3/60 OBB	NPP	12RG	BODINE	B2139-180G	\$87.73
1/50	9.6	41"LBS.	115V DC SHUNT OBB	NSH	12RG	BODINE	B2150-180G	\$80.50
1/50	9.6	41"LBS.	115V DC SHUNT 3" LONG SH. 1/2" DIA. OBB	NSH	12RG	BODINE	6540	\$80.00
1/50	11	37"LBS.	115V AC SP-PHASE REV. OBB	NSI	12RG	BODINE	B2222-150G	\$44.78
1/50	11	37"LBS.	220V AC 3/60 OBB	NPP	12RG	BODINE	B2139-150G	\$87.73
1/50	14	32"LBS.	115V AC SP-PHASE REV. OBB	NSI	12RG	BODINE	B2222-120G	\$44.78
1/50	14	32"LBS.	115V AC CAP REV OBB	NCI	12RG	BODINE	B2258-120G	\$50.07
1/50	14	42"LBS.	115V DC SHUNT OBB	NPP	12RG	BODINE	B2139-120G	\$87.73
1/50	14	32"LBS.	115V DC SHUNT OBB	NSH	12RG	BODINE	B2150-120G	\$49.91
1/50	19	26"LBS.	115V AC SP-PHASE REV. OBB	NSI	12RG	BODINE	B2222-90G	\$44.78
1/50	19	26"LBS.	115V AC CAP REV. OBB	NCI	12RG	BODINE	B2258-90G	\$50.07
1/50	19	26"LBS.	220V AC 3/60 OBB	NPP	12RG	BODINE	B2139-90G	\$87.73
1/50	19	26"LBS.	115V DC SHUNT OBB	NSH	12RG	BODINE	B2150-90G	\$49.91
1/50	29	13"LBS.	115V AC SP-PHASE REV. OBB	NSI	12RH	BODINE	B2222-60H	\$41.00
1/50	29	20"LBS.	115V AC SP-PHASE REV. OBB	NSI	12RG	BODINE	B2222-60G	\$44.78
1/50	29	20"LBS.	115V AC CAP REV. OBB	NCI	12RG	BODINE	B2258-60G	\$50.07
1/50	29	13"LBS.	220V AC 3/60 OBB	NPP	12RH	BODINE	B2139-60H	\$83.14
1/50	29	20"LBS.	220V AC 3/60 OBB	NPP	12RG	BODINE	B2139-60G	\$87.73
1/50	29	20"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	12RG	BODINE	B2223-60G	\$83.90
1/50	29	20"LBS.	115V DC SHUNT OBB	NSH	12RG	BODINE	B2150-60G	\$49.91
1/50	29	13"LBS.	115V DC SHUNT OBB	NSH	12RH	BODINE	B2150-60H	\$54.00
1/50	32	11.8"LBS.	115V AC SP-PHASE REV. OBB	NSI	12RH	BODINE	B2222-54H	\$41.00
1/50	43	11.7"LBS.	115V AC SP-PHASE REV. OBB	NSI	12RH	BODINE	B2222-40H	\$41.00
1/50	43	11.7"LBS.	220V AC 3/60 OBB	NPP	12RH	BODINE	B2139-40H	\$83.14
1/50	43	11.7"LBS.	115V DC SHUNT OBB	NSH	12RH	BODINE	B2150-40H	\$54.00
1/50	57	8.8"LBS.	115V AC SP-PHASE REV. OBB	NSI	12RH	BODINE	B2222-30H	\$41.00
1/50	57	8.8"LBS.	220V AC 3/60 OBB	NPP	12RH	BODINE	B2139-30H	\$83.14
1/50	57	8.8"LBS.	115V DC SHUNT OBB	NSH	12RH	BODINE	B2150-30H	\$54.00
1/50	86	7.3"LBS.	115V AC SP-PHASE REV. OBB	NSI	12RH	BODINE	B2222-20H	\$41.00
1/50	86	7.3"LBS.	220V AC 3/60 OBB	NPP	12RH	BODINE	B2139-20H	\$83.14
1/50	86	7.3"LBS.	115V DC SHUNT OBB	NSH	12RH	BODINE	B2150-20H	\$54.00
1/50	115	6"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	12RH	BODINE	B2222-15H	\$41.00
1/50	115	6"LBS.	220V AC 3/60 OBB	NPP	12RH	BODINE	B2139-15H	\$83.14
1/50	173	4.8"LBS.	115V AC SP-PHASE REV.	NSI	12RH	BODINE	B2222-10H	\$41.00
1/50	173	4.8"LBS.	115V DC SHUNT OBB	NSH	12RH	BODINE	B2150-10H	\$54.00

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HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/50	345	2.4"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	12RH	BODINE	B2222X-05H	\$88.00
1/50	345	2.4"LBS.	220V AC 3/60 OBB	NPP	12RH	BODINE	B2139X-05H	\$112.96
1/50	345	2.4"LBS.	115V DC SHUNT OBB	NSH	12RH	BODINE	B2150X-05H	\$91.36
1/50	690	1.2"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	12RH	BODINE	B2222X-2½H	\$88.00
1/50	690	1.2"LBS.	220V AC 3/60 OBB	NPP	12RH	BODINE	B2139X-2½H	\$112.96
1/50	690	1.2"LBS.	115V DC SHUNT OBB	NSH	12RH	BODINE	B2150X-2½H	\$91.36
1/50	1750	11.3"OZ.	115V AC SP-PHASE REV. OBB	NSI	12	BODINE	B2222	\$22.39
1/50	1750	11.3"OZ.	115V AC CAP REV. OBB	NCI	12	BODINE	B2258	\$27.68
1/50	1750	11.3"OZ.	115V DC SHUNT OBB	NSH	12	BODINE	B2150	\$27.52
1/50	3450	6"OZ.	115V AC SP-PHASE REV. OBB	NSI	12	BODINE	B2228	\$27.52
1/50	3600	6"OZ.	115V AC HY-SYN-CAP REV. BB	NCH	13	BODINE	B7346	\$47.29

## 1/40 HORSEPOWER

1/40	1750	14"OZ.	115V AC 60 CY. FL. MT. BB	NSI	13	BODINE	6547	\$18.00
1/40	1750	14"OZ.	115V AC SP-PHASE REV. BB	NSI	13	BODINE	B2224	\$22.89
1/40	1750	14"OZ.	115V AC CAP REV. 5/16" SH. DIA. OSB	KCI	43	BODINE	6548	\$24.00
1/40	1750	14"OZ.	115V AC CAP REV. OBB	NCI	13	BODINE	B2260	\$28.18
1/40	1750	14"OZ.	115V DC SHUNT OSB	NSH	13	BODINE	6550	\$19.00
1/40	1750	14"OZ.	115V DC SHUNT BB	NSH	13	BODINE	B2152	\$33.32
1/40	3350	8"OZ.	115V AC SP-PHASE REV.	NSI	13	BODINE	B2230	\$28.02
1/40	3350	7.3"OZ.	220V AC 3/60	NPP	13	BODINE	B2147	\$55.00

## 1/25 HORSEPOWER

1/25	30	25"LBS.	115V AC SYN-CAP-REV. OB	NYC	34RH	BODINE	B6210-60H	\$110.03
1/25	45	25"LBS.	115V AC SYN-CAP REV. OBB	NYC	34RH	BODINE	B6210-40H	\$110.03
1/25	42	24"LBS.	115V AC/DC SERIES CW OBB	NSE	11RG	BODINE	B2168-120G	\$41.44
1/25	83	15"LBS.	115V AC/DC SERIES CW OBB	NSE	11RG	BODINE	B2168-60G	\$41.44
1/25	1800	23.1"OZ.	115V AC SYN-CAP REV. OBB	NYC	34	BODINE	B6210	\$42.39
1/25	5000	8.5"OZ.	115V AC/DC OSB	NSE	11	BODINE	2168	\$14.93

## 1/20 HORSEPOWER

1/20	1.2	350"LBS.	116V AC SP-PHASE REV. OBB	NSI	33RJ	BODINE	B4208-1440J	\$152.50
1/20	1.6	340"LBS.	116V AC SP-PHASE REV. OBB	NSI	33RJ	BODINE	B4208-1080J	\$152.50
1/20	1.8	330"LBS.	116V AC SP-PHASE REV. OBB	NSI	33RJ	BODINE	B4208-960J	\$152.50
1/20	1.9	325"LBS.	116V AC SP-PHASE REV. OBB	NSI	33RJ	BODINE	B4208-900J	\$152.50
1/20	2.4	263"LBS.	116V AC SP-PHASE REV. OBB	NSI	33RJ	BODINE	B4208-720J	\$152.50
1/20	2.9	219"LBS.	116V AC SP-PHASE REV. OBB	NSI	33RJ	BODINE	B4208-600J	\$152.50
1/20	3.2	246"LBS.	116V AC SP-PHASE REV. OBB	NSI	33RJ	BODINE	B4208-540J	\$152.50
1/20	3.6	219"LBS.	116V AC SP-PHASE REV. OBB	NSI	33RJ	BODINE	B4208-480J	\$152.50
1/20	4.8	164"LBS.	116V AC SP-PHASE REV. OBB	NSI	33RJ	BODINE	B4208-360J	\$152.50
1/20	8	157"LBS.	220V 3/60 3/4" SH. DIA. TEBB	NPP	33RJ	BODINE	B5107-216J	\$167.93
1/20	29	13"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	33R	BODINE	B4208X-60	\$73.38

**MOTORS—BODINE, G. E., WESTINGHOUSE, MASTER, "PMI" PRINTED MOTOR**  
1/2000 to 2 H.P. geared and non-geared, parallel and right angle drive. All standard and most specials ready for

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**ELECTRONIC VARIABLE SPEED DRIVE • HELLER**  
Electronic controls for D.C. Motors. Provides infinite speed control of D.C. motors through wide speed ranges. Many

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**ELECTRO-MAGNETIC BRAKES, CLUTCHES AND COMBINATIONS • SIMPLATROL**  
Brakes, clutches, clutch-brakes, duplex clutches, clutch couplings, combination

couplings.  
**MECHANICAL VARIABLE SPEED DRIVES: SPEED-MATE, ZERO-MAX.**  
Mechanical variable stepless motor speed control  
**GEARTRONICS—**  
Multi-speed syn-

chronous motors and multi-ratio gear reducers.  
**TIMERS - ATC**  
Interval timers, counters, elapsed time indicators, percentage timers, impulse counter delay timers

**SPEED COUNTING SYSTEMS**  
Hand held counters, Vis-count tachometer generator and meter read out systems  
**RECTIFIER COMPONENTS**  
Silicon and selenium rectifiers. Transformers, chokes.



HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/20	29	13"LBS.	115V AC 1/60 CAP REV. OBB	NCI	33R	BODINE	B3808X-60	\$80.18
1/20	29	13"LBS.	220V AC 3/60 OBB	NPP	33R	BODINE	B4809X-60	\$99.45
1/20	29	13"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	33R	BODINE	B4209X-60	\$91.90
1/20	29	13"LBS.	115V DC SHUNT OBB	NSH	33R	BODINE	B2408X-60	\$74.00
1/20	30	31.5"LBS.	115V AC SYN. SP-PHASE REV. OBB	NSY	34RH	BODINE	B4610-60H	\$94.48
1/20	35.5	20"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	33R	BODINE	B5508-40	\$62.23
1/20	43	20"LBS.	115V AC SP-PHASE REV. OBB	NSI	33R	BODINE	B4208-40	\$44.06
1/20	43	20"LBS.	115V AC CAP REV. OBB	NCI	33R	BODINE	B3808-40	\$50.86
1/20	43	20"LBS.	220V AC 3/60 OBB	NPP	33R	BODINE	B4809-40	\$87.97
1/20	43	20"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	33R	BODINE	B4209-40	\$80.43
1/20	43	20"LBS.	115V DC SHUNT OBB	NSH	33R	BODINE	B2408-40	\$56.09
1/20	45	32"LBS.	115V AC SYN. SP-PHASE REV. OBB	NSY	34RH	BODINE	B4610-40H	\$94.48
1/20	47.5	21"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	33R	BODINE	B5508-30	\$62.23
1/20	57	21"LBS.	115V AC SP-PHASE REV. OBB	NSI	33R	BODINE	B4208-30	\$44.06
1/20	57	21"LBS.	115V AC CAP REV. OBB	NCI	33R	BODINE	B3808-30	\$50.86
1/20	57	21"LBS.	220V AC 3/60 REV. OBB	NPP	33R	BODINE	B4809-30	\$87.97
1/20	57	21"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	33R	BODINE	B4209-30	\$80.43
1/20	57	21"LBS.	115V DC SHUNT OBB	NSH	33R	BODINE	B2408-30	\$56.09
1/20	60	21"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	34R	BODINE	B4610-30	\$82.50
1/20	71.3	18.3"LBS.	115V 1/50 SP-PHASE REV. OBB	NSI	33R	BODINE	B5508-20	\$62.23
1/20	86	18.3"LBS.	115V AC SP-PHASE REV. OBB	NSI	33R	BODINE	B4208-20	\$44.06
1/20	86	18.3"LBS.	115V AC CAP REV. OBB	NCI	33R	BODINE	B3808-20	\$50.86
1/20	86	18.3"LBS.	220V AC 3/60 OBB	NPP	33R	BODINE	B4809-20	\$87.97
1/20	86	18.3"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	33R	BODINE	B4209-20	\$80.43
1/20	86	18.3"LBS.	115V DC SHUNT OBB	NSH	33R	BODINE	B2408-20	\$56.09
1/20	90	17.5"LBS.	115V AC SP-PHASE REV. OBB SYN	NSY	34R	BODINE	B4610-20	\$82.50
1/20	95	15"LBS.	115V AC 1/50 SP-PHASE REV. OBB 1/50	NSI	33R	BODINE	B5508-15	\$62.23
1/20	115	15"LBS.	115V AC SP-PHASE REV. OBB	NSI	33R	BODINE	B4208-15	\$44.06
1/20	115	15"LBS.	115V AC 1/60 CAP REV. OBB	NCI	33R	BODINE	B3808-15	\$80.18
1/20	115	15"LBS.	220V AC 3/60 OBB	NPP	33R	BODINE	B4809-15	\$87.97
1/20	115	15"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	33R	BODINE	B4209-15	\$80.43
1/20	115	15"LBS.	115V DC SHUNT OBB	NSH	33R	BODINE	B2408-15	\$87.96
1/20	120	14.5"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	34R	BODINE	B4610-15	\$82.50
1/20	142.5	11.9"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	33R	BODINE	B5508-10	\$62.23
1/20	173	11.9"LBS.	115V AC SP-PHASE REV. OBB	NSI	33R	BODINE	B4208-10	\$44.06
1/20	173	11.9"LBS.	115V AC CAP REV. OBB	NCI	33R	BODINE	B3808-10	\$50.86
1/20	173	11.9"LBS.	220V AC 3/60 OBB	NPP	33R	BODINE	B4809-10	\$87.97
1/20	173	11.9"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	33R	BODINE	B4209-10	\$80.43
1/20	173	11.4"LBS.	115V DC SHUNT OBB	NSH	33R	BODINE	B2408-10	\$56.09
1/20	180	11.4"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	34R	BODINE	B4610-10	\$82.50
1/20	285	6"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	33R	BODINE	B5508X-05	\$92.05
1/20	345	5.5"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	33R	BODINE	B4208X-05	\$91.72
1/20	345	5.5"LBS.	115V AC 1/60 CAP REV. OBB	NCI	33R	BODINE	B3808X-05	\$98.52
1/20	345	5.5"LBS.	220V AC 3/60 OBB	NPP	33R	BODINE	B4809-X-05	\$117.79

PRICES ARE FOR SINGLE UNIT ORDERS. QUANTITY DISCOUNTS ARE AVAILABLE • ALL MOTORS ARE GUARANTEED FOR A FULL YEAR • NOT ALL ITEMS ARE LISTED, CONTACT COMPANY FOR LATEST INFORMATION • NEW ITEMS ARE ADDED TO STOCK DAILY • 24-HOUR DELIVERY • ALL ITEMS AVAILABLE FROM STOCK • FREE TECHNICAL AND ENGINEERING ASSISTANCE • WHEN ORDERING, PLEASE SPECIFY SHIPPING INSTRUCTIONS • COMPLETE REPAIR SERVICE.





HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/20	345	5.5"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	33R	BODINE	B4209X-05	\$110.25
1/20	345	5.5"LBS.	115V DC SHUNT OBB	NSH	33R	BODINE	B2408X-05	\$106.30
1/20	360	5.5"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	34R	BODINE	B4610X-05	\$100.84
1/20	570	3"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	33R	BODINE	B5508X-02½	\$92.05
1/20	690	3"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	33R	BODINE	B4208X-02½	\$91.72
1/20	690	3"LBS.	115V AC 1/60 CAP REV. OBB	NCI	33R	BODINE	B3808X-02½	\$98.52
1/20	690	3"LBS.	220 V AC 3/60 OBB	NPP	33R	BODINE	B4809X-02½	\$117.79
1/20	690	3"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	33R	BODINE	B4209X-02½	\$110.25
1/20	690	3"LBS.	115V DC SHUNT OBB	NSH	33R	BODINE	B2408X-02½	\$106.30
1/20	720	2.8"LBS.	115V AC 1/60 SYN. SP-PHASE REV.	NSY	34R	BODINE	B4610X-02½	\$100.84
1/20	1125	42"OZ.	115V DC SHUNT OBB	NSH	53	BODINE	B2368	\$52.00
1/20	1425	27"OZ.	115V AC 1/50 SP-PHASE REV. OBB 1/50	NSI	33	BODINE	B5508	\$39.47
1/20	1750	27.9"OZ.	115V AC SP-PHASE REV. OBB	NSI	33	BODINE	B4208	\$25.29
1/20	1750	27.9"OZ.	115V AC CAP REV. OBB	NCI	33	BODINE	B3808	\$32.09
1/20	1750	27.9"OZ.	220/440V AC 3 PHASE TEBB	NPP	34	BODINE	B7170E	\$42.78
1/20	1800	27.9"OZ.	115V AC SYN. SP-PHASE REV. OBB	NSY	34	BODINE	B4610	\$35.59
1/20	1800	28"OZ.	115V AC HY. SYN. CAP REV. BB	NCH	34	BODINE	B7410	\$49.41
1/20	2850	14"OZ.	115V AC 1/50 PHASE REV. OBB 1/50	NSI	33	BODINE	B5610	\$45.68
1/20	3450	14"OZ.	115V AC SP-PHASE REV. OBB	NSI	33	BODINE	B4258	\$30.41
1/20	3600	14"OZ.	115V AC HY. SYN. CAP REV. BB	NCH	34	BODINE	B4760	\$52.92
1/20	7500	6.7"OZ.	115V AC/DC CW OBB SERIES	NSE	11	BODINE	B2190	\$18.27

## 1/18 HORSEPOWER

1/18	83	7"LBS.	115V AC/DC SERIES CW NON-REV. OBB	NSE	12RH	BODINE	B2170X-60H	\$65.61
1/18	125	11.2"LBS.	115V AC/DC SERIES CW NON-REV. OBB	NSE	12RH	BODINE	B2170-40H	\$37.65
1/18	167	8.4"LBS.	115V AC/DC SERIES CW NON-REV. OBB	NSE	12RH	BODINE	B2170-30H	\$65.61
1/18	250	7"LBS.	115V AC/DC SERIES CW NON-REV. OBB	NSE	12RH	BODINE	B2170-20H	\$37.65
1/18	333	5.7"LBS.	115V AC/DC SERIES CW NON-REV. OBB	NSE	12RH	BODINE	B2170-15H	\$65.61
1/18	500	4.5"LBS.	115V AC/DC CW OBB SERIES OBB	NSE	12RH	BODINE	B2170-10H	\$37.65
1/18	1000	2.2"LBS.	115V AC/DC SERIES CW NON-REV. OBB	NSE	12RH	BODINE	B2170X-05H	\$83.95
1/18	2000	1.1"LBS.	115V AC/DC SERIES CW NON-REV. OBB	NSE	12RH	BODINE	B2170X-02½H	\$83.95
1/18	5000	11.5"OZ.	115V AC/DC CW OSB SERIES	NSE	12	BODINE	2170	\$16.65

## 1/16 HORSEPOWER

1/16	5000	13"OZ.	115V AC/DC CW OSB SERIES	NSE	13		2172	\$17.43
1/16	5000	13"OZ.	115V AC/DC CW OBB SERIES	NSE	13		B2172	\$29.00

## 1/15 HORSEPOWER

1/15	4.6	219"LBS.	115V AC 1/50 SP-PHASE REV.	NSI	34RJ	BODINE	B5510-300J	\$112.45
1/15	5.7	219"LBS.	115V AC SP-PHASE REV. OBB	NSI	34RJ	BODINE	B4210-300J	\$85.50
1/15	5.7	219"LBS.	220V AC 3/60 OBB	NPP	34RJ	BODINE	B4811-300J	\$138.94
1/15	5.7	219"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	34RJ	BODINE	B4211-300J	\$131.10
1/15	5.7	219"LBS.	115V DC SHUNT OBB	NSH	34RJ	BODINE	B2410-300J	\$121.00
1/15	8.0	184"LBS.	115V AC SP-PHASE REV. OBB	NSI	34RJ	BODINE	B4210-216J	\$141.86
1/15	9.6	154"LBS.	115V AC SP-PHASE REV. OBB	NSI	34RJ	BODINE	B4210-180J	\$141.86

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1/15	9.9	140"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	34RJ	BODINE	B5510-144J	\$112.45
1/15	11	140"LBS.	115V AC 1/60 CAP REV. WALL MTG. OBB	NCI	34RJ	BODINE	B3810XZ-144J	\$95.00
1/15	12	140"LBS.	115V AC SP-PHASE REV. OBB	NSI	34RJ	BODINE	B4210-144J	\$85.50
1/15	12	140"LBS.	220V AC 3/60 OBB	NPP	34RJ	BODINE	B4811-144J	\$138.94
1/15	12	140"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	34RJ	BODINE	B4211-144J	\$131.10
1/15	12	140"LBS.	115V DC SHUNT OBB	NSH	34RJ	BODINE	B2410-144J	\$121.00
1/15	14.4	117"LBS.	115V AC SP-PHASE REV. OBB	NSI	34RJ	BODINE	B4210-120J	\$141.86
1/15	16	118"LBS.	115V AC SP-PHASE REV. OBB	NSI	34RJ	BODINE	B4210-108J	\$141.86
1/15	17.3	110"LBS.	115V AC SP-PHASE REV. OBB	NSI	34RJ	BODINE	B4210-100J	\$141.86
1/15	19.7	88"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	34RJ	BODINE	B5510-72J	\$112.45
1/15	21.6	88"LBS.	115V AC SP-PHASE REV. OBB	NSI	34RJ	BODINE	B4210-80J	\$141.86
1/15	21.6	88"LBS.	115V AC SP-PHASE REV. OBB	NSI	34RJ	BODINE	B2410-80J	\$153.86
1/15	24	88"LBS.	115V AC SP-PHASE REV. OBB	NSI	34RJ	BODINE	B4210-72J	\$85.50
1/15	24	88"LBS.	220V AC 3/60 OBB	NPP	34RJ	BODINE	B4811-72J	\$138.94
1/15	24	88"LBS.	115V DC SHUNT 3/4" SH. DIA. OBB	NSH	34RJ	BODINE	B2410-72J	\$121.00
1/15	24	88"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	34RJ	BODINE	B4211-72J	\$131.10
1/15	29	33"LBS.	115V AC SP-PHASE REV. OBB	NSI	34RH	BODINE	B4210-60H	\$48.85
1/15	29	33"LBS.	115V AC CAP REV. OBB	NCI	34RH	BODINE	B3810-60H	\$55.65
1/15	29	33"LBS.	220V AC 3/60 OBB	NPP	34RH	BODINE	B4811-60H	\$94.53
1/15	29	33"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	34RH	BODINE	B4211-60H	\$86.68
1/15	29	33"LBS.	115V DC SHUNT OBB	NSH	34RH	BODINE	B2410-60H	\$106.55
1/15	35.5	44"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	34RH	BODINE	B5510-40H	\$68.04
1/15	43	44"LBS.	115V AC SP-PHASE REV. OBB	NSI	34RH	BODINE	B4210-40H	\$48.85
1/15	43	44"LBS.	115V AC CAP REV. OBB	NCI	34RH	BODINE	B3810-40H	\$55.65
1/15	43	44"LBS.	220V AC 3/60 OBB	NPP	34RH	BODINE	B4811-40H	\$94.53
1/15	43	44"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	34RH	BODINE	B4211-40H	\$86.68
1/15	43	44"LBS.	115V DC SHUNT OBB	NSH	34RH	BODINE	B2410-40H	\$62.05
1/15	57	37"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	34RH	BODINE	B4210-30H	\$63.00
1/15	57	37"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	34RH	BODINE	B4211-30H	\$91.70
1/15	57	37"LBS.	115V DC SHUNT OBB	NSH	34RH	BODINE	B2410-30H	\$62.05
1/15	71.3	29"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	34RH	BODINE	B5510-20H	\$68.04
1/15	86	29"LBS.	115V AC SP-PHASE REV. OBB	NSI	34RH	BODINE	B4210-20H	\$48.85
1/15	86	29"LBS.	115V AC CAP REV. OBB	NCI	34RH	BODINE	B3810-20H	\$55.65
1/15	86	29"LBS.	220/440V AC 3/60 OBB	NPP	34RH	BODINE	B5109Z-20H	\$94.53
1/15	86	29"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	34RH	BODINE	B4211-20H	\$86.68
1/15	86	29"LBS.	115V DC SHUNT OBB	NSH	34RH	BODINE	B2410-20H	\$62.05
1/15	86	29"LBS.	220/440V AC 3/60 OBB	NPP	34RH	BODINE	B5109Z-20H	\$82.00
1/15	115	22"LBS.	115V AC 1/60 CAP REV. OBB	NCI	34RH	BODINE	B3810X-15H	\$97.29
1/15	115	22"LBS.	220V AC 3/60 OBB	NPP	34RH	BODINE	B4811X-15H	\$109.81
1/15	115	22"LBS.	115V DC SHUNT OBB	NSH	34RH	BODINE	B2410X-15H	\$106.48
1/15	142.5	17"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	34RH	BODINE	B5510-10H	\$68.04
1/15	173	17"LBS.	115V AC SP-PHASE REV. OBB	NSI	34RH	BODINE	B4210-10H	\$48.85
1/15	173	17"LBS.	115V AC CAP REV. OBB	NCI	34RH	BODINE	B3810-10H	\$55.65

**MOTORS—BODINE, G. E., WESTINGHOUSE, MASTER, "PMI" PRINTED MOTOR**  
1/2000 to 2 H.P. geared and non-geared, parallel and right angle drive. All standard and most specials ready for

immediate delivery. Thousands in stock.  
**ELECTRONIC VARIABLE SPEED DRIVE - HELLER**  
Electronic controls for D.C. Motors. Provides infinite speed control of D.C. motors through wide speed ranges. Many

control and regulation features.  
**ELECTRO-MAGNETIC BRAKES, CLUTCHES AND COMBINATIONS - SIMPLATROL**  
Brakes, clutches, clutch-brakes, duplex clutches, clutch couplings, combination

couplings.  
**MECHANICAL VARIABLE SPEED DRIVES: SPEED-MATE, ZERO-MAX.**  
Mechanical variable stepless motor speed control  
**GEARTRONICS—**  
Multi-speed syn-

chronous motors and multi-ratio gear reducers.  
**TIMERS - ATC**  
Interval timers, counters, elapsed time indicators, percentage timers, impulse counter delay timers

**SPEED COUNTING SYSTEMS**  
Hand held counters. Vis-count tachometer generator and meter read out systems  
**RECTIFIER COMPONENTS**  
Silicon and selenium rectifiers. Transformers, chokes.





HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/15	173	17"LBS.	220V AC 3/60 OBB	NPP	34RH	BODINE	B4811-10H	\$94.53
1/15	173	17"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	34RH	BODINE	B4211-10H	\$86.68
1/15	173	17"LBS.	115V DC SHUNT OBB	NSH	34RH	BODINE	B2410-10H	\$62.05
1/15	285	8.5"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	34RH	BODINE	B5510X-05H	\$90.82
1/15	345	8.5"LBS.	115V AC 1/60 CAP REV. OBB	NCI	34RH	BODINE	B3810X-05H	\$97.29
1/15	345	8.5"LBS.	220V AC 3/60 OBB	NPP	34RH	BODINE	B4811X-05H	\$109.81
1/15	345	8.5"LBS.	115V DC SHUNT OBB	NSH	34RH	BODINE	B2410X-05H	\$106.48
1/15	570	4.3"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	34RH	BODINE	B5510X-2½H	\$110.82
1/15	690	4.3"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	34RH	BODINE	B4210X-2½H	\$100.82
1/15	690	4.3"LBS.	115V AC 1/60 CAP REV. OBB	NCI	34RH	BODINE	B3810X-2½H	\$117.28
1/15	690	4.3"LBS.	115V DC SHUNT OBB	NSI	34RH	BODINE	B2410X-2½H	\$126.98
1/15	1200	56"OZ.	115V AC HY. SYN. CAP REV. OBB	NCH	55	BODINE	B7372	\$65.72
1/15	1425	37"OZ.	115V AC 1/50 SP-PHASE REV.	NSI	34	BODINE	B5510	\$40.15
1/15	1750	38"OZ.	115V AC SP-PHASE REV. OBB	NSI	34	BODINE	B4210	\$25.84
1/15	1750	38"OZ.	115V AC SP-PHASE REV. OBB	NCI	34	BODINE	B3810	\$32.64
1/15	1750	37"OZ.	230V AC 1/60 SP-PHASE REV. OBB	NSI	34	BODINE	B4211	\$58.80
1/15	1750	38"OZ.	115V DC SHUNT OBB	NSH	34	BODINE	B2410	\$39.05
1/15	2850	18"OZ.	115V AC 1/50 SP-PHASE REV. OBB	NSI	34	BODINE	B5612	\$46.36
1/15	3450	18.6"OZ.	115V AC SP-PHASE REV. OBB	NSI	34	BODINE	B4260	\$30.97
1/15	3450	18"OZ.	230V AC 1/60 SP-PHASE REV.	NSI	34	BODINE	B4261	\$56.97
1/15	10000	7"OZ.	115V AC/DC OBB	NSE	11	BODINE	B2206	\$18.27

1/12 HORSEPOWER

1/12	29	44"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	53R	BODINE	B4218X-60	\$86.29
1/12	29	44"LBS.	220V AC 3/60 OBB	NPP	53R	BODINE	B4819X-60	\$107.00
1/12	29	44"LBS.	115V DC SHUNT OBB	NSH	53R	BODINE	B2418X-60	\$126.54
1/12	30	42"LBS.	115V AC 1/60 SYN. SP-PHASE REV.	NSY	54R	BODINE	B4620X-60	\$97.78
1/12	35.5	55"LBS.	115V AC 1/50 SP-PHASE REV.	NSI	53R	BODINE	B5512-40	\$72.10
1/12	43	55"LBS.	115V AC SP-PHASE REV. OBB	NSI	53R	BODINE	B4218-40	\$51.19
1/12	43	55"LBS.	220V AC 3/60 OBB	NPP	53R	BODINE	B4819-40	\$98.64
1/12	43	55"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	53R	BODINE	B4219-40	\$90.79
1/12	43	55"LBS.	115V DC SHUNT OBB	NSH	53R	BODINE	B2418-40	\$75.00
1/12	57	46"LBS.	220V AC 3/60 OBB	NPP	53R	BODINE	B4819-30	\$107.00
1/12	60	44"LBS.	115V AC SYN. SP-PHASE REV. OBB	NSY	54R	BODINF	B4620-30	\$97.78
1/12	86	41"LBS.	115V AC 1/60 SP-PHASE REV. 5/8" SH. R.A.	MC88208		BOSTON	6586	\$49.00
1/12	86	37"LBS.	115V AC SP-PHASE REV. OBB	NSI	53R	BODINE	B4218-20	\$51.19
1/12	90	35"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	54R	BODINE	B4620-20	\$97.78
1/12	115	30"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	53R	BODINE	B4218X-15	\$93.33
1/12	115	30"LBS.	220V AC 3/60 OBB	NPP	53R	BODINE	B4819X-15	\$121.42
1/12	115	30"LBS.	115V DC SHUNT OBB	NSH	53R	BODINE	B2418X-15	\$106.54
1/12	120	28"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	54R	BODINE	B4620X-15	\$104.82
1/12	142.5	21"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	53R	BODINE	B5512-10	\$72.10
1/12	173	21"LBS.	115V AC SP-PHASE REV. OBB	NSI	53R	BODINE	B4218-10	\$51.19

PRICES ARE FOR SINGLE UNIT ORDERS, QUANTITY DISCOUNTS ARE AVAILABLE • ALL MOTORS ARE GUARANTEED FOR A FULL YEAR • NOT ALL ITEMS ARE LISTED, CONTACT COMPANY FOR LATEST INFORMATION • NEW ITEMS ARE ADDED TO STOCK DAILY • 24-HOUR DELIVERY • ALL ITEMS AVAILABLE FROM STOCK • FREE TECHNICAL AND ENGINEERING ASSISTANCE • WHEN ORDERING, PLEASE SPECIFY SHIPPING INSTRUCTIONS • COMPLETE REPAIR SERVICE.





HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/12	173	21"LBS.	220V AC 3/60 OBB	NPP	53R	BODINE	B4819-10	\$98.64
1/12	173	21"LBS.	115V DC SHUNT OBB	NSH	53R	BODINE	B2418-10	\$75.00
1/12	180	20"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	54R	BODINE	B4620-10	\$97.78
1/12	345	11"LBS.	115V AC 1/60 SP-PHASE REV.	NSI	53R	BODINE	B4218X-05	\$93.33
1/12	345	11"LBS.	220V AC 3/60 OBB	NPP	53R	BODINE	B4819X-05	\$121.42
1/12	345	11"LBS.	115V DC SHUNT OBB	NSH	53R	BODINE	B2418X-05	\$106.54
1/12	360	11"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	54R	BODINE	B4620X-05	\$104.82
1/12	690	5.5"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	53R	BODINE	B4218X-2 1/2	\$113.32
1/12	690	5.5"LBS.	220V AC 3/60 OBB	NPP	53R	BODINE	B4819X-2 1/2	\$141.42
1/12	690	5.5"LBS.	115V DC SHUNT OBB	NSH	53R	BODINE	B2418X-2 1/2	\$126.54
1/12	720	5.5"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	54R	BODINE	B4620X-2 1/2	\$124.81
1/12	1125	70"OZ.	115V DC SHUNT OBB	NSH	54	BODINE	B2370	\$58.00
1/12	1750	47"OZ.	115V AC SP-PHASE REV. OSB 3/8" SH. DIA.	USI	34	BODINE	9006XZ	\$19.00
1/12	1750	47"OZ.	115V DC SHUNT OBB	NSH	53	BODINE	B2418	\$51.00
1/12	1750	47"OZ.	230V AC 3/60 3/8" SH. FL. MT. TEBB	NPP	35	BODINE	6589	\$31.00
1/12	1750	47"OZ.	440V AC 3/60 3/8" SH. FL. MT. TEB B	NPP	35	BODINE	6590	\$31.00
1/12	1800	47"OZ.	115V AC SP-PHASE REV. OBB	NSY	54	BODINE	B4620	\$40.94
1/12	3450	23"OZ.	115V AC CCW 3/8" SH. DIA. TEBB	NSI	35	BODINE	6593	\$39.00
1/12	3450	24.4"OZ.	220/440V AC 3/60 TEBB	NPP	34	BODINE	B5139EZ	\$41.00
1/12	7500	11.5"OZ.	115V AC/DC CW OBB SERIES	NSE	12	BODINE	B2192	\$20.00
<b>1/10 HORSEPOWER</b>								
1/10	83	10"LBS.	115V AC/DC SERIES NON-REV. CW OBB	NSE	33R	BODINE	B5258X-60	\$76.08
1/10	167	15.1"LBS.	115V AC/DC SERIES NON-REV. CW OBB	NSE	33R	BODINE	B5258-30	\$76.08
1/10	250	12.5"LBS.	115V AC/DC CW OBB SERIES	NSE	33R	BODINE	B5258-20	\$46.29
1/10	333	10.4"LBS.	115V AC/DC CW OBB SERIES	NSE	33R	BODINE	B5258-15	\$46.29
1/10	500	8.2"LBS.	115V AC/DC CW OBB SERIES	NSE	33R	BODINE	B5258-10	\$46.29
1/10	1000	4.1"LBS.	115V AC/DC CW OBB SERIES	NSE	33R	BODINE	B5258X-05	\$94.42
1/10	1750	56"OZ.	115V DC 1/2" SH. DIA. RD. BDY. TESB	A7064	G56	DELCO	6598	\$19.00
1/10	1750	56"OZ.	230V DC COMPOUND 1/2" SH. DIA. OBB	DM63G	G56	CENTURY	6599	\$27.00
1/10	2000	2.1"LBS.	115V AC/DC SERIES CW OBB	NSE	33R	BODINE	B5258X-2 1/2	\$107.38
1/10	5000	20.14"OZ.	115V AC/DC CW OSB SERIES	NSE	33R	BODINE	5258	\$19.83
1/10	7500	13.4"OZ.	115V AC/DC CW OBB SERIES	NSE	13	BODINE	B2194	\$20.78
1/10	10000	10"OZ.	115V AC/DC CW OBB SERIES	NSE	12	BODINE	B2208	\$20.00
<b>1/8 HORSEPOWER</b>								
1/8	29	50"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	54RL	BODINE	B4220X-60L	\$93.84
1/8	29	50"LBS.	220V AC 3/60 OBB	NPP	54RL	BODINE	B4821X-60L	\$112.43
1/8	29	50"LBS.	115V DC SHUNT OBB	NSH	54RL	BODINE	B2420X-60L	\$112.33
1/8	35.5	73"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	54RL	BODINE	B5514-40L	\$77.01
1/8	37.5	143"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	55RH	BODINE	B4622-48H	\$153.48
1/8	43	73"LBS.	115V AC SP-PHASE REV. OBB	NSI	54RL	BODINE	B4220-40L	\$56.26

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**TIMERS - ATC**  
Interval timers, counters, elapsed time indicators, percentage timers, impulse counter delay timers

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HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/8	43	73"LBS.	220V AC 3/60 OBB	NPP	54RL	BODINE	B4821-40L	\$105.77
1/8	43	73"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	54RL	BODINE	B4221-40L	\$97.49
1/8	43	73"LBS.	115V DC SHUNT OBB	NSH	54RL	BODINE	B2420-40L	\$71.52
1/8	47.5	66"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	54RL	BODINE	B5514-30L	\$77.01
1/8	50	115"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	55RH	BODINE	B4622-36H	\$153.48
1/8	57	66"LBS.	115V AC SP-PHASE REV. OB B	NSI	54RL	BODINE	B4220-30L	\$56.26
1/8	57	66"LBS.	115V DC SHUNT OBB	NSH	54RL	BODINE	B2420-30L	\$71.52
1/8	57	77"LBS.	115/230V AC 1/60 CAP REV. EX. PRF.	RO	H56RW	JANNETTE	65100	\$100.00
1/8	57	66"LBS.	220V AC 3/60 OBB	NPP	54RL	BODINE	B4821-30L	\$105.77
1/8	57	66"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	54RL	BODINE	B4221-30L	\$97.49
1/8	58	157"LBS.	115/230V AC R.A. TEBB	RA	G56RW	MASTER	65101	\$60.00
1/8	60	95"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	55RH	BODINE	B4622-30H	\$153.48
1/8	66	40"LBS.	115V AC/DC SERIES CW OBB	NSE	34RH	BODINE	B5260X-75H	\$115.27
1/8	72	40"LBS.	115/230V AC 5/8" SH. DIA. R.A. OBB	RA	5215RW	MASTER	65102	\$55.00
1/8	75	85"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSY	55RH	BODINE	B4622-24H	\$153.48
1/8	83	51"LBS.	115V AC/DC SERIES CW OBB	NSE	34RH	BODINE	B5260X-60H	\$88.19
1/8	86	54"LBS.	115V AC SP-PHASE REV. OBB	NSI	54RL	BODINE	B4220-20L	\$56.26
1/8	86	54"LBS.	220V AC 3/60 OBB	NPP	54RL	BODINE	B4821-20L	\$105.77
1/8	86	54"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	54RL	BODINE	B4221-20L	\$97.49
1/8	86	54"LBS.	550V AC 3/60 OBB	NPP	54RL	BODINE	65103	\$105.77
1/8	86	54"LBS.	115V DC SHUNT OBB	NSH	54RL	BODINE	B2420-20L	\$71.52
1/8	100	62"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	55RH	BODINE	B4622-18H	\$153.48
1/8	115	40"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	54RL	BODINE	B4220X-15L	\$101.94
1/8	125	28.4"LBS.	115V AC/DC CW OBB SERIES	NSE	34RH	BODINE	B5260-40H	\$52.80
1/8	142.5	32"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	54RL	BODINE	B5514-10L	\$77.01
1/8	167	23"LBS.	115V AC/DC SERIES CW OBB	NSE	34RH	BODINE	B5260X-30H	\$88.19
1/8	173	32"LBS.	115V AC SP-PHASE REV. OBB	NSI	54RL	BODINE	B4220-10L	\$56.26
1/8	173	32"LBS.	220V AC 3/60 OBB	NPP	54RL	BODINE	B4821-10L	\$105.77
1/8	173	32"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	54RL	BODINE	B4221-10L	\$97.49
1/8	173	32"LBS.	115VDC SHUNT OBB	NSH	54RL	BODINE	B2420-10L	\$71.52
1/8	180	36"LBS.	115V AC 1/60 SYN. SP-PHASE REV. OBB	NSY	55RH	BODINE	B4622-10H	\$153.48
1/8	199	30"LBS.	115V AC 1/60 SP-PHASE REV. 7/8" SH. R.A.	5KH45	712	G. E.	65104	\$46.00
1/8	250	19"LBS.	115V AC/DC CW OBB SERIES	NSE	34RH	BODINE	B5260-20H	\$52.80
1/8	333	17"LBS.	115V AC/DC SERIES CW OBB	NSE	34RH	BODINE	B5260X-15H	\$94.80
1/8	345	16"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	54RL	BODINE	B4220X-05L	\$101.94
1/8	345	16"LBS.	220V AC 3/60 OBB	NPP	54RL	BODINE	B4821X-05L	\$128.05
1/8	345	16"LBS.	115V DC SHUNT OBB	NSH	54RL	BODINE	B2420-05L	\$120.53
1/8	500	10"LBS.	115V AC/DC CW SERIES OBB	NSE	34RH	BODINE	B5260-10H	\$52.80
1/8	690	8"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	54RL	BODINE	B4220X-2½L	\$119.46
1/8	690	8"LBS.	220V AC 3/60 OBB	NPP	54RL	BODINE	B4821X-2½L	\$139.10
1/8	690	8"LBS.	115V DC SHUNT OBB	NSH	54RL	BODINE	B2420X-2½L	\$137.95
1/8	820	139"OZ.	220/440V AC 3/60 5/8" SH. DIA. TEBB	181M	G56	BALDOR	65105	\$31.00
1/8	840	139"OZ.	440V AC 3/60 1/2" SH. DIA. TEBB	P-63	48	ELEC-MACH.	65106	\$30.00

**MOTORS—BODINE, G. E., WESTINGHOUSE, MASTER, "PMI" PRINTED MOTOR**  
1/2000 to 2 H.P. geared and non-geared, parallel and right angle drive. All standard and most specials ready for

immediate delivery. Thousands in stock.  
**ELECTRONIC VARIABLE SPEED DRIVE • HELLER**  
Electronic controls for D.C. Motors. Provides infinite speed control of D.C. motors through wide speed ranges. Many

control and regulation features.  
**ELECTRO-MAGNETIC BRAKES, CLUTCHES AND COMBINATIONS • SIMPLATROL**  
Brakes, clutches, clutch-brakes, duplex clutches, clutch couplings, combination

couplings.  
**MECHANICAL VARIABLE SPEED DRIVES: SPEED-MATE, ZERO-MAX.**  
Mechanical variable stepless motor speed control  
**GEARTRONICS—**  
Multi-speed syn-

chronous motors and multi-ratio gear reducers.  
**TIMERS - ATC**  
Interval timers, counters, elapsed time indicators, percentage timers, impulse counter delay timers

**SPEED COUNTING SYSTEMS**  
Hand held counters. Vis count tachometer generator and meter read out systems  
**RECTIFIER COMPONENTS**  
Silicon and selenium rectifiers. Transformers, chokes.



HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/8	860	139"OZ.	220/440V AC 3/60 OBB BK. MTR.	PA	F66	MASTER	65107	\$69.00
1/8	860	139"OZ.	115V DC SHUNT 1/2" SH. DIA. OBB	-----	54	BLK-DKR.	65108	\$52.00
1/8	860	139"OZ.	115V DC COMPOUND 1/2" SH. RD. BDY.	-----	48	PACKARD	65109-1	\$52.00
1/8	1000	5"LBS.	115V AC/DC SERIES CW OBB	NSE	34RH	BODINE	B5260X-05H	\$94.80
1/8	1150	6.5"LBS.	208V AC 3/60 5/8" SH. DIA. OBB	SC62L	G56	CENTURY	65110	\$30.00
1/8	1425	70"OZ.	230V AC 50 CY. 1/2" SH. OSB	5SH45	G56	G. E.	65111	\$19.00
1/8	1425	70"OZ.	420V AC 3/50 RD. BDY. 1/2" SH. OBB	PA	48	MASTER	65112	\$24.00
1/8	1425	70"OZ.	500V AC 3/50 1/2" SH. DIA. TEBB	NPP	55	BODINE	65113	\$63.10
1/8	1425	70"OZ.	550V AC 3/50 1/2" SH. DIA. TEBB	NPP	55	BODINE	65114	\$63.10
1/8	1650	70"OZ.	440V AC 3 PH. 3/8" SH. FL. MT. OBB	GJ599	-----	ELINCO	65115	\$29.00
1/8	1750	70"OZ.	115V DC COMPOUND 1/2" SH. DIA. OSB	SD1236	48	G. E.	65116	\$21.00
1/8	1750	70"OZ.	115V DC COMPOUND 1/2" SH. DIA. OSB	5BC36	48	G. E.	65117	\$25.00
1/8	1750	70"OZ.	115V DC SHUNT 1/2" SH. DE. E. 1" LONG	164	55	MARATHON	65118	\$27.50
1/8	1750	70"OZ.	115V DC SHUNT OBB	NSH	54	BODINE	B2420	\$54.00
1/8	1750	70"OZ.	230V DC COMPOUND 1/2" SH. DIA. OSB	5BC42AB	48	G. E.	65119	\$30.00
1/8	1750	70"OZ.	230V DC COMPOUND 1/2" SH. DIA. OSB	D124	48	ROB-MYRS.	65120	\$22.00
1/8	1750	70"OZ.	250V DC SHUNT 1/2" SH. DIA. OSB	FK	48	WEST.	65121	\$23.00
1/8	1800	70"OZ.	115V AC SYN. SP-PHASE REV. OBB	NSY	55	BODINE	B4622	\$41.26
1/8	1800	70"OZ.	220/440V AC SYN. 3 PH. 1/2" SH. XP BB	-----	G56	ELEC.	65122	\$75.00
1/8	2000	70"OZ.	115V AC/DC SERIES CW OBB	NSE	34RH	BODINE	B5260X-2 1/2 H	\$115.27
1/8	3400	2.5"LBS.	220V AC 3/60 RD. BDY. 5/16" SH. DIA. OBB	FBT2922	13	I. M. C.	65123	\$19.00
1/8	3450	35"OZ.	115/230V AC 1/60 TEBB	RA	5815	MASTER	65124	\$28.00
1/8	3450	35"OZ.	220V AC 2/60 OBB	PA	5215	MASTER	65125	\$19.00
1/8	3450	35"OZ.	115V DC COMPOUND OBB	5BC36	48	G. E.	65126	\$29.00
1/8	3450	35"OZ.	230V DC COMPOUND 1/2" SH. DIA. OBB	DM	5210	MASTER	65127	\$34.00
1/8	3600	35"OZ.	115V AC 1/60 SYN. CAP REV. FL. MT. OBB	GLXJMR	-----	ELINCO	65128	\$68.00
1/8	5000	25.17"OZ.	115V AC/DC SERIES OSB	NSE	34	BODINE	5260	\$21.42

## 1/7 HORSEPOWER

1/7	10000	14.6"OZ.	115V AC/DC CW OBB SERIES	NSE	13	BODINE	B2110	\$20.78
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## 1/6 HORSEPOWER

1/6	2.09	2100"LBS.	115V AC 60 CY. 1-1/8" SH. PAR. BK. MTR	RA	G56TP	MASTER	65129	\$135.00
1/6	29	130"LBS.	115V DC COMPOUND 7/8" SH. R.A. OBB	5BC44	712	G. E.	65130-1	\$115.00
1/6	29.7	198"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	55RH	BODINE	B5516-48H	\$113.34
1/6	36	198"LBS.	115V AC SP-PHASE REV. OBB	NSI	55RH	BODINE	B4222-48H	\$80.88
1/6	36	198"LBS.	115/230V AC 60 CY. 3/4" SH. R.A.	RA	5815	MASTER	65131	\$79.00
1/6	36	198"LBS.	220V AC 3/60 3/4" SH. R.A.	5K45	712	G. E.	65132	\$70.00
1/6	36	198"LBS.	220V AC 3/60 OBB	NPP	55RH	BODINE	B4823-48H	\$137.54
1/6	36	198"LBS.	230V AC 1/60 SP-PHASE REV.	NSI	55RH	BODINE	B4223-48H	\$129.47
1/6	39.5	160"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	55RH	BODINE	B5516-36H	\$113.34
1/6	48	160"LBS.	115V AC SP-PHASE REV. OBB	NSI	55RH	BODINE	B4222-36H	\$80.88
1/6	48	160"LBS.	220V AC 3/60 OBB	NPP	55RH	BODINE	B4823-36H	\$137.54
1/6	48	160"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	55RH	BODINE	B4223-36H	\$129.47

THOUSANDS OF OTHER STANDARD MOTORS  
THAT COULDN'T BE INCLUDED  
IN THIS LISTING ARE IN STOCK  
OR  
MOTORS CAN BE MADE TO YOUR  
SPECIAL REQUIREMENTS IN OUR  
EXPERIENCED SHOP.  
ANY  
SPEED, TORQUE, OR VOLTAGE  
THAT YOU WANT



HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/6	57	131"LBS.	115V AC SP-PHASE REV. OBB	NSI	55RH	BODINE	B4222-30H	\$80.88
1/6	57	131"LBS.	220V AC 3/60 OBB	NPP	55RH	BODINE	B4823-30H	\$137.54
1/6	57	131"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	55RH	BODINE	B4223-30H	\$129.47
1/6	58	98"LBS.	220V AC 3/60 VERT. DOWN 3/4" SH. XPBB	PA	G56RW	MASTER	65133	\$92.00
1/6	58	98"LBS.	230V DC SHUNT 3/4" SH. R.A. XPBB	DM	G56RW	MASTER	65134	\$170.00
1/6	59.4	118"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	55RH	BODINE	B5516-24H	\$113.34
1/6	72	118"LBS.	115V AC SP-PHASE REV. OBB	NSI	55RH	BODINE	B4222-24H	\$80.88
1/6	72	86"LBS.	115/230V AC 60 CY. 3/4" SH. DIA. OBB	RA	G56RW	MASTER	65135	\$74.90
1/6	72	118"LBS.	220V AC 3/60 OBB	NPP	55RH	BODINE	B4823-24H	\$137.54
1/6	72	118"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	55RH	BODINE	B4223-24H	\$129.47
1/6	79.3	86"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	55RH	BODINE	B5516-18H	\$113.34
1/6	82	85"LBS.	115/230V AC 160 3/4" SH. VERT. XPBB	RA	G56RW	MASTER	65134	\$89.00
1/6	84	95"LBS.	440V AC 3/60 PAR. DR. TEBB	5K45	120	G. E.	65135	\$69.00
1/6	96	86"LBS.	115V AC SP-PHASE REV. OBB	NSI	55RH	BODINE	B4222-18H	\$80.88
1/6	96	86"LBS.	220V AC 3/60 OBB	NPP	55RH	BODINE	B4823-18H	\$137.54
1/6	108	64"LBS.	220V AC 3/60 3/4" SH. DIA. R.A. OBB	SO	G56RW	JANNETTE	65136	\$62.00
1/6	142.5	50"LBS.	115V AC 1/50 SP-PHASE REV. OBB	NSI	55RH	BODINE	B5516-10H	\$113.34
1/6	173	50"LBS.	115V AC SP-PHASE REV. OBB	NSI	55RH	BODINE	B4222-10H	\$80.88
1/6	173	50"LBS.	220V AC 3/60 OBB	NPP	55RH	BODINE	B4823-10H	\$137.54
1/6	173	50"LBS.	230V AC 1/60 SP-PHASE REV. OBB	NSI	55RH	BODINE	B4223-10H	\$129.47
1/6	216	42"LBS.	115V AC 1/60 SP-PHASE REV. OBB	NSI	55RH	BODINE	B4222-08H	\$143.76
1/6	216	42"LBS.	220V 3/60 OBB	NPP	55RH	BODINE	B4823-08H	\$164.28
1/6	243	32"LBS.	115V DC COMPOUND PAR. 7/8" SH. OBB	5BC44A	120	G. E.	65137-1	\$110.00
1/6	260	30"LBS.	115V DC COMPOUND PAR. 7/8" SH. TEBB	5BC44A	120	G. E.	65138-1	\$108.00
1/6	860	139"LBS.	115V DC COMPOUND 5/8" SH. OBB	5BC44AB	56	G. E.	65139-1	\$76.00
1/6	860	11.5"LBS.	115V DC COMPOUND 5/8" SH. DIA. OBB	DM-67L	56	CENTURY	65140-1	\$79.00
1/6	1140	140"OZ.	115V AC 60 CY. CAP REV. 1/2" SH. OBB	F48	42	CENTURY	65141	\$39.00
1/6	1425	93"OZ.	220/380V AC 3/50 TEBB	PS	56	CENTURY	65141-A	\$36.00
1/6	1620	98"OZ.	115V AC 1/60 CAP REV. FL. MT. OBB	ZB107		DIEHL	65142	\$38.00
1/6	1750	93"OZ.	115V AC SP-PHASE REV. RD. BDY. TEBB		56	JOHNSON	65143	\$27.00
1/6	1750	93"OZ.	220V AC 3/60 1/2" SH. DIA. OSB	5K43	56	G. E.	65144	\$20.00
1/6	1750	93"OZ.	220V AC 3/60 1/2" SH. DIA. TEBB	5K36	42	G. E.	65145	\$25.00
1/6	1750	93"OZ.	220/440V AC 3/60 TEBB	NPP	55	BODINE	B7172E	\$43.72
1/6	1750	93"OZ.	440V AC 3/60 1/2" SH. DIA. OSB	5K43	56	G. E.	65146	\$28.00
1/6	1750	93"OZ.	32V DC 5/8" SH. DIA. OBB		56	CENTURY	65147(S)	\$47.00
1/6	1750	93"OZ.	115V DC COMPOUND 5/8" SH. DIA. OBB	24809X	56	CENTURY	65148	\$60.00
1/6	1750	93"OZ.	115V DC COMPOUND 1/2" SH. DIA. TEBB	5BC42	56	G. E.	65149	\$60.00
1/6	1750	93"OZ.	240V DC RD. BDY. 1/2" SH. DIA. TESB	A3515	56	DELCO	65150	\$30.00

#### 1/4 HORSEPOWER

1/4	12.6	620"LBS.	220/440V AC R.A. FL. MT. 1" SH. TEBB	RI	PS24	JANNETTE	65151	\$98.00
1/4	13.5	536"LBS.	115V DC SHUNT TEBB R.A.	DM	G56RC	MASTER	65151-1	\$172.00
1/4	17	588"LBS.	115V DC SHUNT PAR DR. FL. BASE MT. TEBB	DS13	JA1	JANNETTE	65152	\$160.00
1/4	19	500"LBS.	115/230V AC 1/60 REP-IND. R.A. 1" SH. OBB	RA	7417RW	MASTER	65153	\$89.00

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Mechanical variable stepless motor speed control  
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Interval timers, counters, elapsed time indicators, percentage timers, impulse counter delay timers

**SPEED COUNTING SYSTEMS**  
Hand held counters. Vis-count tachometer generator and meter read out systems  
**RECTIFIER COMPONENTS**  
Silicon and selenium rectifiers. Transformers, chokes.



HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/4	29	177"LBS.	115V DC SHUNT OBB	NSH	55RH	BODINE	B2422XZ-60H	\$167.30
1/4	35.9	230"LBS.	220V AC 3/60 R.A. 7/8" SH. OBB	MD2848W		BOSTON	65154	\$80.00
1/4	36	298"LBS.	115/230V AC 1/60 CL. 1-GP. D-XP 3/4" SH.	RA	G56RW	MASTER	65155	\$110.00
1/4	36	298"LBS.	208/220V AC 3/60 R.A. 3/4" SH. OBB	PA	G56RW	MASTER	65156	\$80.00
1/4	36	298"LBS.	115V DC SHUNT OBB	NSH	55RH	BODINE	B2422Z-48H	\$122.00
1/4	48	240"LBS.	115V DC SHUNT OBB	NSH	55RH	BODINE	B2422Z-36H	\$122.00
1/4	56	165"LBS.	230V DC COMPOUND 3/4" SH. DIA. OBB	IR-DM-65AJC4		CENTURY	65157	\$95.00
1/4	58	147"LBS.	115/230V AC 1/60 R.A. 3/4" SH. DIA. OBB	RA	G56RW	MASTER	65158	\$81.00
1/4	58	147"LBS.	230V DC COMPOUND 7/8" SH. DIA. OBB	5BC44	713	G. E.	65159	\$98.00
1/4	72	175"LBS.	220/440V AC 3/60 R.A. 7/8" SH. DIA. OBB	5K42	712	G. E.	65160	\$78.00
1/4	72	177"LBS.	115V DC SHUNT OBB	NSH	55RH	BODINE	B2422Z-24H	\$122.00
1/4	74	175"LBS.	115V AC 1/60 CAP-REV. R.A. 7/8" SH. TEBB	5KC37	712	G. E.	65161	\$79.00
1/4	96	130"LBS.	115VDC SHUNT OBB	NSH	55RH	BODINE	B2422Z-18H	\$122.00
1/4	98	120"LBS.	115V DC COMPOUND 1" SH. DIA. OBB	DM	7425SP	MASTER	65162	\$110.00
1/4	99	110"LBS.	115/230V AC 1/60 CAP-REV. 7/8" SH. TEBB	5KC37	712	G. E.	65163	\$79.00
1/4	100	150"LBS.	220/440V AC 3/60 PAR. DR. 7/8" SH. OBB	5K42	120	G. E.	65164	\$78.00
1/4	148	120"LBS.	220/440V AC 3/60 R.A. 7/8" SH. TEB	5K35	712	G. E.	65165	\$79.00
1/4	163	117"LBS.	230V DC COMPOUND 7/8" SH. DIA. OBB	5BC44	120	G. E.	65166	\$115.00
1/4	172	76"LBS.	115V DC SHUNT 3/4" SH. DIA. OBB	NSH	55RH	BODINE	B2422Z-10H	\$122.00
1/4	190	78"LBS.	115V DC SHUNT TEBB PARALLEL	DM	G56DP	MASTER	65166 -1	\$166.00
1/4	216	70"LBS.	115V DC SHUNT OBB	NSH	55RH	BODINE	B2422XZ08H	\$167.30
1/4	350	43"LBS.	440V AC 3/60 PAR. DR. 7/8" SH. DIA. OBB	5K43	120	C. E.	65167	\$67.00
1/4	420	35"LBS.	115V DC SHUNT PAR. DR. 3/4" SH. DIA. TEBB	DM	G56SP	MASTER	65168	\$157.00
1/4	420	35"LBS.	115V DC SHUNT EXP-PROOF PAR	DM	G56SP	MASTER	65168 -1	\$175.00
1/4	420	35"LBS.	115V DC SHUNT PAR. DR. 3/4" SH. DIA. OBB	DM	G56SP	MASTER	65169	\$167.00
1/4	440	25"LBS.	220/440V AC 3/60 VERT. DOWN 3/4 SH. TEBB	RA	G56RW	MASTER	65171	\$65.00
1/4	487	32"LBS.	230V DC COMPOUND 7/8" SH. DIA. OBB	5BC44A	120	G. E.	65172	\$110.00
1/4	520	30"LBS.	230V DC COMPOUND 7/8" SH. PAR. DR. TEBB	5BC44	120	G. E.	65172	\$98.00
1/4	780	19"LBS.	115V DC SHUNT TEBB PAR. DR. 3/4" SH. DIA.			MASTER	65172 -1	\$147.00
1/4	860	8.5"LBS.	115V DC COMPOUND FL. MT. 5/8" SH. OBB	DM	H56	MASTER	65173-1	\$79.00
1/4	860	17"LBS.	115/230V AC CAP-RUN 3/4" SH. TESB	FH	66	WEST.	65173	\$58.00
1/4	860	17.5"LBS.	115V DC SHUNT 3/4" SH. DIA. OBB		66	CENTURY	65174-1	\$103.90
1/4	860	17.5"LBS.	115V DC COMPOUND FT. MT. 3/4" SH. OBB		H66	MASTER	65175-1	\$103.90
1/4	860	17.5"LBS.	115V DC COMPOUND 5/8" SH. DIA. OBB		56	MARATHON	65176-1	\$109.00
1/4	860	17.5"LBS.	208/220V AC 3/60 3/4" SH. BK. MTR. OBB	PA	F66	MASTER	65177	\$90.00
1/4-12	860/1750	17.5"LBS.	208/220V AC 3/60 2-SPD. BK. MTR. OBB	PA	F66	MASTER	65178	\$90.00
1/4	1140	13"LBS.	208/220V AC 3/60 5/8" SH. DIA. OSB	5K45	56	G. E.	65179	\$39.00
1/4	1140	13"LBS.	220/440V AC 2/60 3/4" SH. DIA. TEBB	PA	G66	MASTER	65180	\$27.50
1/4	1140	13"LBS.	440V AC 3/60 BRAKE MOTOR 5/8" SH. TEBB		H56	MASTER	65181	\$60.00
1/4	1140	13"LBS.	115V DC SHUNT 5/8" SH. DIA. TEBB	DM	56	MARATHON	65182	\$95.00
1/4	1425	8"LBS.	115V AC 1/50 SP-PHASE 1/2" SH. DIA. OBB	KSM	42	ROB-MYRS.	65183	\$21.00
1/4	1425	8"LBS.	115V AC 1/50 SP-PHASE 1/2" SH. DIA. OSB	FHT	48	WEST.	65183	\$22.00
1/4	1450	8"LBS.	220/308V AC 3/50 5/8" SH. DIA. OSB	P9	56	PEERLESS	65184	\$32.00

PRICES ARE FOR SINGLE UNIT ORDERS, QUANTITY DISCOUNTS ARE AVAILABLE • ALL MOTORS ARE GUARANTEED FOR A FULL YEAR • NOT ALL ITEMS ARE LISTED, CONTACT COMPANY FOR LATEST INFORMATION • NEW ITEMS ARE ADDED TO STOCK DAILY • 24-HOUR DELIVERY • ALL ITEMS AVAILABLE FROM STOCK • FREE TECHNICAL AND ENGINEERING ASSISTANCE • WHEN ORDERING, PLEASE SPECIFY SHIPPING INSTRUCTIONS • COMPLETE REPAIR SERVICE.





HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/4	1725	8.7"LBS.	115V DC STAB. SHUNT 5/8" SH. DIA. TEBB	DP	56-4	MARATHON	65184-1	\$79.00
1/4	1725	139"OZ.	115V DC EXP-PROOF SHUNT B.B.	DM	G56	MASTER	65184-1	\$115.00
1/4	1750	139"OZ.	115V AC/DC OBB	NSH	55	BODINE	B2422Z	\$74.00
1/4	1750	139"OZ.	115V AC 1/60 BK. MTR. 5/8" SH. DIA. OBB	5KC36	42	G. E.	65185	\$65.00
1/4	1750	8.7"LBS.	220/440V AC 3/60 5/8" SH. DIA. OSB	P9	56	PEERLESS	65186	\$28.00
1/4	1750	139"OZ.	230V AC 1/60 SP-PHASE 5/8" SH. DIA. OSB	KS145	56	ROB-MYRS.	65187	\$20.00
1/4	1750	139"OZ.	230V AC 1/60 BK. MTR. 5/8" SH. DIA. OBB	5KC36	42	G. E.	65188	\$73.00
1/4	1750	139"OZ.	115V DC SHUNT 1/2" SH. DIA. OBB	-----	54	BLK & DKR	65189	\$39.00
1/4	1750	139"OZ.	115V DC SHUNT 3/4" SH. DIA. TEBB	DM	G66	MASTER	65190	\$78.00
1/4	1750	8.7"LBS.	230V DC COMPOUND RD. BDY. 1/2" SH. OSB	-----	56	PACKARD	65191	\$32.50
1/4	1750	139"OZ.	230V DC SHUNT 1/2" SH. DIA. OBB	-----	54	BLK & DKR	65192	\$42.00
1/4	1750	139"OZ.	230V DC COMPOUND 5/8" SH. DIA. OBB	DM651	56	CENTURY	65193	\$49.00
1/4	1800	139"OZ.	115V AC 1/60 HYS-SYN. 3/4" SH. DIA. OBB	5NC67	73	G. E.	65194	\$110.00
1/4	1800	8.7"LBS.	220V AC 3/60 SYNCHRONOUS B.B.	DP	56	B & B	65195-1	\$115.00
1/4	2000	130"OZ.	230V DC COMPOUND 5/8" SH. DIA. OBB	5BC44	56	G. E.	65196	\$60.00
1/4	3450	4.4"LBS.	220V AC 3/60 5/8" SH. DIA. OBB	-----	56	DYNALINE	65197-1	\$21.00
1/4	3450	69"OZ.	115V DC SHUNT TEBB 1/2" DIA. SHAFT	-----	-----	B & B	65199-1	\$78.00
1/4	3450	4.4"LBS.	115V DC COMPOUND 1/2" SH. DIA. OSB	5BC42	56	G. E.	65198	\$65.00
1/4	3450	4.4"LBS.	115V DC SHUNT BAL. ARM. 1/2" SH. DIA. OBB	-----	RE316	B & B	65199	\$69.00
1/4	3450	4.4"LBS.	115V DC COMPOUND 1/2" SH. DIA. OBB	5BC42	56	G. E.	65200	\$80.00
1/4	3450	4.4"LBS.	220V DC COMPOUND 1/2" SH. DIA. OBB	5BC44	56	G. E.	65201	\$60.00
1/4	3450	4.4"LBS.	230V DC COMPOUND 5/8" SH. DIA. OBB	DM	G56	MASTER	65202	\$75.00
1/4	6500	2.3"LBS.	115V AC/DC SERIES 5/16" SH. DIA. OBB	SPN720	34	HOWARD	65203	\$29.50
1/4	7500	2.1"LBS.	115V AC/DC SERIES 5/16" SH. DIA. OBB	P	68M	G. E.	65204	\$29.50
1/4	10000	25.18"OZ.	115V AC/DC CW OBB	NSE	34	BODINE	B5460	\$44.00

## 1/3 HORSEPOWER

1/3	10	1500"LBS.	115/230V AC 1/60 1" SH. DIA. D.E. SH. BK.	RA	G56TP	MASTER	65205	\$110.00
1/3	19	520"LBS.	115/230V AC 1/60 REP-IND. 1" SH. R.A. OBB	RA	7517RW	MASTER	65206-1	\$96.00
1/3	72	172"LBS.	115V DC SHUNT 1" SH. DIA. R.A. OBB	DM	G56RW	MASTER	65207(A)	\$160.00
1/3	72	172"LBS.	230V DC SHUNT 3/4" SH. DIA. R.A. OBB	DM	G56RW	MASTER	65208(A)	\$163.00
1/3	74	170"LBS.	115/230V AC 1/60 CAP-REV. 7/8" SH. TEBB	5KC43	712	G. E.	65209	\$85.00
1/3	74	170"LBS.	220/440V AC 3/60 R.A. 7/8" SH. DIA. OBB	5K43	712	G. E.	65210	\$85.00
1/3	86	154"LBS.	115V AC 1/60 REV. 3/4" SH. DIA. R.A. OBB	RA	H56RW	MASTER	65211	\$85.00
1/3	86	154"LBS.	115V DC SHUNT EXP-PROOF R.A.	DM	H56RW	MASTER	65211-1	\$189.00
1/3	99	137"LBS.	115/230V AC 1/60 CAP-REV. 7/8" SH. TEBB	5KC43	712	G. E.	65212	\$87.00
1/3	173	89"LBS.	220/440V AC 3/60 R.A. 3/4" D.E. SH. OBB	PA	H56RW	MASTER	65213	\$87.50
1/3	173	89"LBS.	115V DC SHUNT 3/4" SH. DIA. R.A. OBB	DM	G56RW	MASTER	65314	\$160.00
1/3	173	89"LBS.	230V DC SHUNT 3/4" SH. DIA. R.A. OBB	DM	G56RW	MASTER	65215(A)	\$163.00
1/3	190	103"LBS.	115V DC SHUNT TEBB PARALLEL	DM	H56DP	MASTER	65215(A)-1	\$176.00
1/3	230	75"LBS.	220V AC 3/60 R.A. 7/8" SH. DIA. OBB	MD3807W	-----	BOSTON	65216	\$75.00

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Hand held counters. Vis-count tachometer generator and meter read out systems  
**RECTIFIER COMPONENTS**  
Silicon and selenium rectifiers. Transformers, chokes.



HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/3	3450	5.6"LBS.	220V AC 3/60 OBB	.....		56	DYNALINE 65247	\$27.00
1/3	3450	5.6"LBS.	115V DC STAB. SHUNT 5/8" SH. DIA. TEBB	DP		H56	B & B 65247-1	\$90.00
1/3	3450	5.6"LBS.	220/440V AC 3/60 5/8" SH. DIA. OBB	3B		1152B	HOOVER 65248	\$34.00
1/3	3450	5.6"LBS.	440V AC 3/50-60 5/8" SH. DIA. OBB	ZBE		56	DIEHL 65249	\$25.00
1/3	3450	5.6"LBS.	440V AC 3/60 5/8" SH. DIA. TEBB	5K47		56	G. E. 65250	\$28.00
1/3	3450	5.6"LBS.	115V DC SHUNT 5/8" SH. DIA. OBB	5BC44AB17		56	G. E. 65251E	\$80.00
1/3	3450	5.6"LBS.	230V DC COMPOUND 5/8" SH. DIA. OSB	5BC43		56	G. E. 65252	\$54.00
1/3	3600	5.6"LBS.	220V AC 3/60 SYNCHRONOUS 5/8" SH. OBB	SL		56	ROB-MYRS. 65253	\$75.00
1/3	9000	2"LBS.	115V AC/DC SERIES 1/2" SH. OBB CW	CS		34	BLK & DKR 65254	\$50.00
1/3	420	47"LBS.	208/220V AC 3/60 PAR. 7/8" SH. DIA. TEBB	5K45		120	G. E. 65217	\$80.00
1/3	420	47"LBS.	115V DC SHUNT PAR. 3/4" SH. DIA. OBB	DM		H56SP	MASTER 65218(A)	\$162.00
1/3	420	47"LBS.	115V DC SHUNT EXP-PROOF PAR.	DM		H56SP	MASTER 65218(A)-1	\$185.00
1/3	420	47"LBS.	115V DC SHUNT 3/4" SH. DIA. TEBB	DM		H56SP	MASTER 65219	\$170.00
1/3	600	34.5"LBS.	115V DC COMP DPBB 3/4" SH. DIA.	H66		5BC44	G. E. 65219-1	\$105.00
1/3	780	26.2"LBS.	230V DC SHUNT PAR. TEBB 3/4" SH. DIA.	DM		H56SP	MASTER 65219(A)	\$169.00
1/3	860	24"LBS.	115V DC SHUNT 5/8" SH. DIA. OBB	DM		56	B & B 65220-1	\$115.00
1/3	960	17"LBS.	220/380V AC 3/50 5/8" SH. DIA. OBB	KB		56	HOOVER 65222-1	\$48.00
1/3	960	17"LBS.	220/380V AC 3/50 3/4" SH. DIA. TEBB	PA		F66	MASTER 65223-1	\$49.00
1/3	960	17"LBS.	220/380V AC 3/50 3/4" SH. DIA. OBB	ZP63P		66	DIEHL 65224-1	\$49.00
1/3	1140	17"LBS.	220/440V AC 3/60 5/8" SH. DIA. OBB	KB		56	HOOVER 65225	\$33.00
1/3	1140	17"LBS.	220/440V AC 3/60 3/4" SH. DIA. OB	ZP63P		66	DIEHL 65226	\$40.00
1/3	1140	17"LBS.	220/440V AC 3/60 3/4" SH. DIA. OB	PA		F66	MASTER 65227	\$50.00
1/3	1140	17"LBS.	115V DC SHUNT 5/8" SH. DIA. TEBB	DP		56	MARATHON 65228(A)	\$110.00
1/3	1150	17"LBS.	220/440V AC 3/60 5/8" SH. DIA. OBB	SC		56	CENTURY 65229	\$37.00
1/3	1725	11.5"LBS.	115V DC STAB. SHUNT 5/8" SH. DIA. TEBB	DP		56	MARATHON 65229-1	\$95.00
1/3	1725	11.5"LBS.	115V DC COMP. 5/8" SH. DIA. TEBB	5BC44		56	G. E. 65229(A)	\$105.00
1/3	1750	11.5"LBS.	208/220V AC 3/60 EX. PROOF 5/8" SH. BB.	PA		H56	MASTER 65230	\$47.00
1/3	1750	11.5"LBS.	220V AC 3/60 5/8" SH. DIA. OSB	SC6SL		56	CENTURY 65231	\$22.00
1/3	1750	11.5"LBS.	220V AC 3/60 5/8" SH. DIA. OSB	LF56		56	ROB-MYRS 65232	\$29.00
1/3	1750	11.5"LBS.	220V AC 3/60 EX. PROOF 5/8" SH. SM	FS		56	WEST. 65233	\$42.00
1/3	1750	11.5"LBS.	220V AC 3/60 EX. PROOF 5/8" SH. DIA BB	5K45		56	G. E. 65234	\$48.00
1/3	1750	11.5"LBS.	220V AC 360 BK. MTR. 5/8" SH. DIA. OBB	.....		G66	STAR 65235	\$49.00
1/3	1750	11.5"LBS.	220/440V AC 3/60 5/8" SH. DIA. OSB	.....		56	STD-DYTN. 65236	\$23.00
1/3	1750	11.5"LBS.	115V DC SHUNT 5/8" SH. DIA. OBB	DP		56	MARATHON 65237	\$72.00
1/3	1750	11.5"LBS.	115V DC SHUNT 3/4" SH. DIA. TEBB	DM		J66	MASTER 65238-1	\$83.00
1/3	1750	11.5"LBS.	115V DC SHUNT EX. PROOF 5/8" SH. DIA. BB	DM		H56	MASTER 65239	\$125.00
1/3	1750	11.5"LBS.	230V DC COMP. FL. MT. 5/8" SH. DIA. OBB	DM		H56	MASTER 65240	\$69.00
1/3	1750	11.5"LBS.	230V DC COMPOUND 5/8" SH. DIA. OBB	DM		56	CENTURY 65241	\$72.00
1/3	3000	5.6"LBS.	60V ARM-24V FIELD BB	5BA50LJ1		.....	G. E. 65242	\$19.00
1/3	3000	5.6"LBS.	220/380V AC 1/60 CAP-REV. 5/8" SH. OSB	5KC47AB		56	G. E. 65243	\$38.00
1/3	3350	5.6"LBS.	115V AC 1/60 CAP-REV. 1/2" SH. FL. MT. OBB	GJXJMR		.....	ELINCO 65244	\$38.00
1/3	3450	5.6"LBS.	115/230V AC 1/60 CAP-REV. 5/8" SH. OBB	.....		56	HOWELL 65245	\$27.50
1/3	3450	5.6"LBS.	208/220V AC 3/50-60 5/8" SH. DIA. OBB	ZP		56	DIEHL 65246	\$28.00

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HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/2 HORSEPOWER								
1/2	6	2300"LBS.	220/440V AC 3/60 BK. MTR. R.A. TEBB	PA	7420WRC	MASTER	65255	\$145.00
1/2	30	675"LBS.	115/230V AC CAP-REV. 1" SH. R.A. OBB	MFGW	56-5	U. S.	65256	\$105.00
1/2	45	575"LBS.	220/440V AC 3/60 R.A. 1" SH. DIA. OBB	MFGW	56-5	U. S.	65257	\$107.00
1/2	48	354"LBS.	115/230V AC 1/60 CAP-REV. 1" SH.	5KC63	713	G. E.	65258	\$98.00
1/2	48	355"LBS.	230V DC SHUNT EX. PROOF 1" SH. DIA. R.A.	DM	7420RW	MASTER	65259(A)	\$245.00
1/2	59	320"LBS.	550V AC 3/25 R.A. 1" SH. DIA. OBB	PA	7418RW	MASTER	65260	\$75.00
1/2	68	292"LBS.	220/440V AC 3/60 RA. 1" SH. DIA. TEBB	SSV	56-6	U. S.	65261	\$99.00
1/2	72	258"LBS.	115V DC SHUNT 1" SH. DIA. R.A. OBB	DM	7418RW	MASTER	65262(A)	\$199.00
1/2	72	258"LBS.	230V DC SHUNT 1" SH. DIA. R.A. OBB	DM	7418RW	MASTER	65263(A)	\$203.00
1/2	173	133"LBS.	115V DC SHUNT 1" SH. DIA. R.A. OBB	DM	7418RW	MASTER	65264(A)	\$199.00
1/2	173	133"LBS.	230V DC SHUNT 1" SH. DIA. R.A. OBB	DM	7418RW	MASTER	65265(A)	\$203.00
1/2	280	109"LBS.	115V DC SHUNT 1" SH. DIA. PAR. OBB	DM	7418SP	MASTER	65266(A)	\$181.00
1/2	280	109"LBS.	230V DC SHUNT 1" SH. DIA. PAR. OBB	DM	7418SP	MASTER	65267(A)	\$183.00
1/2	420	70"LBS.	115V DC COMPOUND 1" SH. DIA. PAR. OBB	DM	7418SP	MASTER	65268	\$140.00
1/2	420	70"LBS.	115V DC SHUNT 1" SH. DIA. PAR. OBB	DM	7418SP	MASTER	65269(A)	\$176.00
1/2	420	70"LBS.	230V DC SHUNT 1" SH. DIA. PAR. OBB	DM	7418SP	MASTER	65270(A)	\$179.00
1/2	700/200		115/230V AC 160 BRUSH SHIFTING OBB	LK	201	STAR-KIMBLE	65271	\$120.00
1/2	780	39"LBS.	230V DC SHUNT PAR. TEBB 3/4" SH. DIA.	DM	7418SP		65271	\$180.00
1/2	860	34"LBS.	115V DC COMP. 3/4" SH. DIA. TESB	DM	93	CENTURY	65272	\$175.00
1/2	860	34.7"LBS.	115 DC TESB COMPOUND 3/4" SH. DIA.	5BC	73	B & B	65272 -1	\$195.00
1/2	1140	26.2"LBS.	220/440V AC 3/60 3/4" SH. DIA. TEBB	5K73	73	G. E.	65273	\$59.00
1/2	1150	26.2"LBS.	115/230V AC 1/60 REP-IND EXP. PROOF BB	RA	7437	MASTER	65274	\$80.00
1/2	1150	26.2"LBS.	230V DC SHUNT 1" SH. DIA. OBB	5B224	224	G. E.	65275	\$125.00
1/2	1460	19"LBS.	220/440V AC 325 3/4" SH. DIA. OBB	OGS	J66	LOUIS-ALLIS	65276	\$46.00
1/2	1750	17"LBS.	208/220V AC 3/60 BK. MTR. 3/4" SH. OBB	PA	J66	MASTER	65277	\$90.00
1/2-1/4	1750/860		208/220V AC 3/60 2-SP. BK. MT. 3/4" SH. BB	PA	F66	MASTER	65278	\$90.00
1/2	1750	17.5"LBS.	220V AC 3/60 RD. BDY. 3/4" SH. DIA. OSB	5K63	66	G. E.	65279	\$29.50
1/2	1750	17.5"LBS.	220V AC 3/60 3/4" SH. DIA. OSB	5K63	66	G. E.	65280-1	\$36.50
1/2	1750	17.5"LBS.	220V AC 3/60 XP CL. 1-GRP. D. 3/4" SH. BB	5K63AC	66	G. E.	65281	\$69.00
1/2	1750	17.5"LBS.	220/440V AC 3/60 3/4" SH. DIA. OSB	PA	7418	MASTER	65282	\$36.00
1/2	1750	17.5"LBS.	220/440V AC 3/60 5/8" SH. DIA. OBB	56T17	56	MARATHON	65283	\$44.00
1/2	1750	17.5"LBS.	220/440V AC 3/60 3/4" SH. DIA. TEBB	5K63	66	G. E.	65284	\$48.00
1/2	1750	17.5"LBS.	115V DC COMPOUND 5/8" SH. DIA OBB		56	MARATHON	65285	\$85.00
1/2	1750	17.5"LBS.	115V DC SHUNT 5/8" SH. DIA. OBB		56	MARATHON	65286	\$89.50
1/2	1750	17.5"LBS.	115V DC SHUNT 3/4" SH. DIA. OBB	DM	66	CENTURY	65287	\$95.00
1/2	1750	17.5"LBS.	220V DC COMPOUND 5/8" SH. DIA. OBB		56	MARATHON	65289	\$87.50
1/2	1750	17.5"LBS.	230V DC COMPOUND FL. MT. 3/4" SH. OBB	DM	J66	MASTER	65290	\$90.00
1/2	1750	17.5"LBS.	230V DC SHUNT 3/4" SH. DIA. OBB	DM	J66	CENTURY	65291	\$93.00
1/2	1750	17.5"LBS.	250V DC SERIES XP 3/4" SH. DIA. BB	5BC74A	66	G. E.	65292	\$120.00
1/2	1800	17.5"LBS.	220V AC 3/60 SYNCHRONOUS BB	5K	182	B & B	65293	\$130.00
1/2	3450	8.7"LBS.	115/230V AC 1/60 CAP-REV. 5/8" SH. OBB		56	HOWELL	65294	\$37.00
1/2	3450	8.7"LBS.	208/220V AC 3/60 5/8" SH. DIA. OBB	S	56	ROB-MYRS.	65295	\$29.50

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HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
1/2	3450	8.7"LBS.	220/440V AC 3/60 5/8" SH. DIA. OBB		56	HOOVER	65296	\$37.00
1/2	3450	8.7"LBS.	220/440V AC 3/60 5/8" SH. DIA. OBB	KB	56	DIEHL	65297	\$37.00
1/2	3450	8.7"LBS.	115V SHUNT FL. MT. OBB	60903-03		LAMB	65298	\$37.00
1/2	3450	8.7"LBS.	115V DC COMPOUND 1/2" D.E. SH. OBB		56	DELTA	65299	\$43.50
1/2	3450	8.7"LBS.	230V DC COMPOUND 5/8" SH. DIA. OBB	5BC44	56	G. E.	65300(E)	\$74.00
1/2	7000	6"LBS.	115V DC SHUNT 5/8" SH. DIA. OBB	5BC44	56	G. E.	65301	\$110.00
3/4 HORSEPOWER								
3/4	58	555"LBS.	220/440V AC 3/60 R.A. 1" SH. DIA. OBB	5K73	713	G. E.	65301	\$95.00
3/4	72	420"LBS.	208/220/440V AC 3/60-50 1" SH. R.A. OBB	PA	7418RW	MASTER	65302	\$110.00
3/4	72	492"LBS.	115V DC SHUNT 1" SH. DIA. R.A. OBB	DM	7425RW	MASTER	65303(A)	\$225.00
3/4	72	492"LBS.	230V DC SHUNT 1" SH. DIA. R.A. OBB	DM	7425RW	MASTER	65304(A)	\$230.00
3/4	96	270"LBS.	115/230V AC 1/60 REP-IND. 1" SH. R.A. OBB	RA	7425RW	MASTER	65305	\$110.00
3/4	96	270"LBS.	208/220/440V AC 3/60-50 BK. MT. 1" SH. OB	PA	7418RW	MASTER	65306	\$115.00
3/4	125	300"LBS.	220V DC COMPOUND 1" SH. DIA. PAR. OBB	DM	7418DP	MASTER	65307	\$205.00
3/4	172	199"LBS.	115V DC SHUNT 1" SH. DIA. R.A. OBB	DM	7425RW	MASTER	65308(A)	\$225.00
3/4	172	199"LBS.	230V DC SHUNT 1" SH. DIA. R.A. OBB	DM	7425RW	MASTER	65309(A)	\$230.00
3/4	280	163"LBS.	115V DC SHUNT 1" SH. DIA. PAR. OBB	DM	7425SP	MASTER	65310(A)	\$240.00
3/4	280	163"LBS.	230V DC SHUNT 1" SH. DIA. PAR. OBB	DM	7425SP	MASTER	65311(A)	\$240.00
3/4	420	109"LBS.	115V DC SHUNT 1" SH. DIA. PAR. OBB	DM	7425SP	MASTER	65312(A)	\$240.00
3/4	420	109"LBS.	230V DC SHUNT 1" SH. DIA. PAR. OBB	DM	7425SP	MASTER	65313(A)	\$240.00
3/4	850	26"LBS.	115V DC SHUNT OBB	QNY	224	LOUIS-ALLIS	65314(W)	\$180.00
3/4	860	26"LBS.	220/440V AC 3/60 1" SH. DIA. OBB	CS	224	WEST.	65315	\$79.00
3/4	860	26"LBS.	220/440V AC 3/60 1" SH. DIA. TEBB	CS	224	WEST.	65316	\$88.00
3/4	860	26"LBS.	220V DC COMPOUND 1" SH. DIA. OBB	DM	204	MASTER	65317	\$130.00
3/4	860	26"LBS.	230V DC COMPOUND 3/4" SH. DIA. OBB	SC	204	CENTURY	65318	\$140.00
3/4	860	26.2"LBS.	115V DC COMPOUND 3/4" SH. DIA. TESB	DM	73	B & B	65DYN-1	\$220.00
3/4	1140	39"LBS.	440V AC 3/60-50 BK. MT. 5/8" SH. DIA. TEBB	PA	F182	MASTER	65319	\$89.00
3/4	1140	39"LBS.	220V DC SHUNT 3/4" SH. DIA. OSB	5B203	203	G. E.	65320	\$105.00
3/4	1200	39"LBS.	220/440V AC 3/60-50 3/4" SH. DIA. OBB	BK	203	DELCO	65321	\$65.00
3/4	1425	26"LBS.	130/-260V AC 1/50 CAP-REV. 5/8" SH. OSB	5KC47	56	B & B	65322	\$43.00
3/4	1425	26.2"LBS.	220V AC 3/25 3/4" SH. DIA. TEBB	PS	93	CENTURY	65322A	\$47.00
3/4	1750	26"LBS.	115V AC 1/60 CAP-REV. 5/8" SH. DIA. OSB	FHT	56	WEST.	65323	\$33.00
3/4	1750	26"LBS.	115/230V AC 1/60 CAP-REC. 3/4" SH. TH. OV	CS	66	EMERSON	65324(D)	\$43.00
3/4	1750	26"LBS.	115/230V AC 1/60 CAP-REV. 3/4" SH. OSB	FHT	66	WEST.	65325	\$49.00
3/4	1750	26"LBS.	115/230V AC CAP-REV. 1/60 3/4" SH. OBB	KB	66	HOOVER	65326	\$52.00
3/4	1750	26"LBS.	115/230V AC CAP-REV. 1/60 3/4" SH. OBB		66	HOOVER	65327	\$52.00
3/4	1750	26"LBS.	220/440V AC 3/60-50 3/4" SH. DIA. OSB	FH	66	WEST.	65328	\$42.50
3/4	1750	26"LBS.	220/440V AC 3/60-50 5/8" SH. DIA. OBB	DP	56	MARATHON	65329	\$50.00
3/4	1750	26"LBS.	220/440V AC 3/60-50 XP 5/8" SH. DIA. BB	5K42	56	G. E.	65330	\$67.00
3/4	1750	17.5"LBS.	12V DC COMPOUND 3/4" SH. OBB	A408	66	KURZ & ROOTS	65331(D)	\$99.00
3/4	1750	26"LBS.	115V DC COMPOUND 3/4" SH. DIA. OBB	DMAHC4	66	CENTURY	65332	\$98.00
3/4	1750	26"LBS.	220V DC COMPOUND 5/8" SH. DIA. OBB	DP	56	MARATHON	65333	\$94.00

PRICES ARE FOR SINGLE UNIT ORDERS. QUANTITY DISCOUNTS ARE AVAILABLE • ALL MOTORS ARE GUARANTEED FOR A FULL YEAR • NOT ALL ITEMS ARE LISTED. CONTACT COMPANY FOR LATEST INFORMATION • NEW ITEMS ARE ADDED TO STOCK DAILY • 24-HOUR DELIVERY • ALL ITEMS AVAILABLE FROM STOCK • FREE TECHNICAL AND ENGINEERING ASSISTANCE • WHEN ORDERING, PLEASE SPECIFY SHIPPING INSTRUCTIONS • COMPLETE REPAIR SERVICE.



HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
3/4	1750	26"LBS.	220V DC SHUNT 5/8" SH. DIA. OBB	DP	56	MARATHON	65334	\$94.00
3/4	1750	26"LBS.	220V DC COMPOUND 3/4" SH. DIA. OBB	DM	66	CENTURY	65335	\$94.00
3/4	1750	17.5"LBS.	220V DC ST. SHUNT 3/4" SH. DIA. OBB	LK	203	STAR	65336	\$100.00
3/4	1750	17.5"LBS.	230V DC THYMOTROL FL. MT. 3/4" SH. OBB	5BC204A1073		G. E.	65337(D)	\$135.00
3/4	3450	8.7"LBS.	115/230V AC 1/60 REP-IND. 3/4" SH. OBB	RA	7425	MASTER	65338	\$52.00
3/4	3450	8.7"LBS.	220V AC 3/60-50 3/4" SH. DIA. OBB	PM	66	DYNALINE	65339(D)	\$32.50
3/4	3450	8.7"LBS.	220/440V AC 3/60 3/4" SH. DIA. TEBB	ZP	66	DIEHL	65340	\$47.00
3/4	3450	8.7"LBS.	230V DC COMPOUND 3/4" SH. DIA. OSB	5BC73	73	G. E.	65341	\$99.00
3/4	3450	13"LBS.	230V DC STAB. SHUNT 5/8" SH. DIA. TEBB	DP	56-7	MARATHON	65341-1	\$120.00
3/4	6500	6"LBS.	115V A/C DC SERIES 5/8" SH. DIA. FL. MT. BB	CSC	66	LAMB	65342	\$98.00

## 1 HORSEPOWER

1	16.5	2500"LBS.	115V DC SHUNT BK. MTR. 1-1/4" SH. TEBB	DM	204TP	MASTER	65343	\$195.00
1	72	560"LBS.	208/220/440V AC 3/60 R.A. 1" SH. DIA. OBB	PA	203RW	MASTER	65344	\$120.00
1	96	460"LBS.	230V DC COMPOUND 1" SH. DIA. R.A. OBB	DM	203RW	MASTER	65345	\$180.00
1	144	332"LBS.	220/440V AC 3/60 R.A. 1" SH. DIA. TEBB	PA	203RW	MASTER	65346	\$140.00
1	224	266"LBS.	220/440V AC 3/60 PAR. DR. 1-1/8" SH. OBB	5K203	203	G. E.	65347(D)	\$160.00
1	860		230V DC SHUNT 1" SH. DIA. OB	QNX	224	LOUIS-ALLIS	65348(W)	\$199.00
1	1140		220/440V AC 3/60 RD. BDY. 3/4" SH. OBB	SC	204	CENTURY	65349(D)	\$60.00
1	1150/2300		230V DC SHUNT VAR. SPD. 1" SH. DIA. OSB	CT	209	RELIANCE	65350	\$145.00
1	1200		115/220V AC 1/60 EXP. PROOF 1" SH. BB	LE	224	LELAND	65351	\$120.00
1	1200		115V DC COMPOUND 3/4" SH. DIA. TEBB	A8320	224	DELCO	65352	\$79.00
1	1425		220V AC 3/25 3/4" SH. DIA. TEBB	5K	77	GE	65352-1	\$62.00
1	1750		115/230V AC 1/60 REP-IND. 7/8" SH. OBB	RA	182	MASTER	65353	\$69.50
1	1750		115/-230V AC 1/60 EXP. PROOF REP-IND. BB	PM	203	DYNALINE	65354(D)	\$109.00
1	1750		220/440V AC 3/60 3/4" SH. DIA. OBB	KB	203	HOOVER	65355	\$56.00
1	1750		220/440V AC 3/60 3/4" SH. DIA. OBB	PA	203	MASTER	65356	\$57.50
1	1750		220/440V AC 3/60 3/4" SH. DIA. OBB	QG	203	IDEAL	65357	\$57.50
1	1750		115V DC COMPOUND 3/4" SH. DIA. OSB	5B203	203	G. E.	65358	\$120.00
1	1750		230V DC COMPOUND 3/4" SH. DIA. TESB	DM	73	CENTURY	65359	\$129.00
1	1750		230V DC COMPOUND 3/4" SH. DIA. TESB	5BC74	73	G. E.	65360	\$130.00
1	1750		230V DC COMPOUND 3/4" SH. DIA. TEBB	5BC74	73	G. E.	65361	\$140.00
1	1750		230V DC SHUNT 3/4" SH. DIA. TEBB	QNX	204	LOUIS-ALLIS	65362(W)	\$168.00
1	1750		230V DC SHUNT 3/4" SH. DIA. OBB	DM	203	CENTURY	65363(W)	\$168.00
1	3450		115V DC COMPOUND 3/4" SH. DIA. TEBB	5BC74	73	G. E.	65364	\$125.00

**MOTORS—BODINE, G. E., WESTINGHOUSE, MASTER, "PMI" PRINTED MOTOR**  
1/2000 to 2 H.P. geared and non-geared, parallel and right angle drive. All standard and most specials ready for

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**ELECTRONIC VARIABLE SPEED DRIVE - HELLER**  
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Hand held counters. Vis-count tachometer generator and meter read out systems  
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Silicon and selenium rectifiers. Transformers, chokes.





HP	RPM	TORQUE	ELECTRICAL SPECIFICATIONS	TYPE	FRAME	MFG.	CAT. No.	PRICE
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## 1-1/2 HORSEPOWER

1-1/2	48	1320"LBS.	230V DC COMPOUND R.A. 1-1/4" SH. OBB	DM	225RW	MASTER	65365	\$240.00
1-1/2	125	710"LBS.	115/230V AC 1/60 PAR. DR. 1" SH. DIA. OBB	RA	204DP	MASTER	65366	\$165.00
1-1/2	125	710"LBS.	220/440V AC 3/60 BRAKE PAR. 1" SH. OBB	PA	204DP	MASTER	65367	\$175.00
1-1/2	350	262"LBS.	220/440V AC 3/60 PAR. DR. 1-1/8" SH. OBB	5K204	204SP	G. E.	65368(S)	\$235.00
1-1/2	420	218"LBS.	230V DC COMPOUND 1" SH. PAR. OBB	DM	204SP	MASTER	65369	\$250.00
1-1/2	860	.....	220/440V AC 1-1/8" SH. DIA. OBB	CSP	254	WEST.	65370	\$105.00
1-1/2	1140	.....	220/440V AC 3/60 1" SH. DIA. OBB	CSP	224	WEST.	65371	\$80.00
1-1/2	1140	.....	220/440V AC 3/60 7/8" SH. DIA. OBB	SC	184	U. S.	65372	\$90.00
1-1/2	1140	.....	220/440V AC 3/60 EX. PROOF 1 SH. OBB	LE	224	LELAND	65373	\$125.00
1-1/2	1140	.....	440V AC 3/60 BK. MTR. 7/8" SH. DIA. TEBB	PA	F184	MASTER	65474	\$130.00
1-1/2	1150	.....	115V AC SHUNT 1" SH. DIA. OBB	5B224	224	G. E.	65375	\$150.00
1-1/2	1750	.....	115/230V AC 160 CAP-REV. 1" SH. DIA. TEBB	CS	225	CENTURY	65376	\$110.00
1-1/2	1750	.....	220/440V AC 3/60 7/8" SH. DIA. OBB	PA	184	RELIANCE	65377(D)	\$55.00
1-1/2	1750	.....	220/440V AC 3/60 EX. PROOF 3/4" SH. BB	LE	204	LELAND	65378	\$105.00
1-1/2	1750	.....	460V DC COMPOUND 3/4" SH. DIA. OBB	DN	204	CENTURY	65379	\$110.00
1-1/2	3450	.....	220/440V AC 3/60 3/4" SH. DIA. OBB	3B	125B	KINGSTON-C'EY	65380	\$63.00

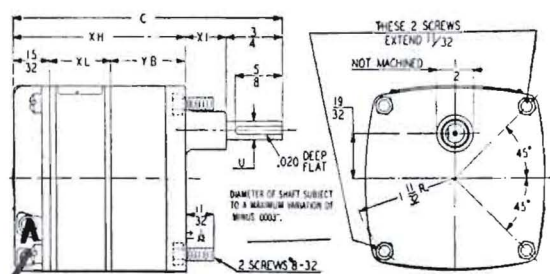
## 2 HORSEPOWER

2	13	8400"LBS.	220/440V AC EX. PROOF 2-1/2" SH. PAR. DR.	5KB563	225	G. E.	65381	\$375.00
2	48	1500"LBS.	220/440V AC 3/60 1-1/4" SH. DIA. R.A. OBB	PA	224RW	MASTER	65382	\$155.00
2	1140	.....	208/461V AC BK. MTR. 3/60 1" SH. DIA. OBB	CB	225	RELIANCE	65383	\$135.00
2	1140	.....	220/440V AC 3/60 E. PROOF 1" SH. DIA. BB	LE	225	LELAND	65384	\$140.00
2	1150	.....	230V DC SHUNT 1" SH. DIA. OBB	5BA122	225	G. E.	65385	\$185.00
2	1150	.....	230V DC COMPOUND 1" SH. DIA. OSB	DN	225	CENTURY	65386	\$190.00
2	1150	.....	230V DC COMPOUND 1" SH. DIA. OBB	C	225	STAR	65387(D)	\$225.00
2	1725	.....	220/440V AC 3/60 7/8" SH. DIA. TEBB	K	184	GE	65387-1	\$71.00
2	1750	.....	115/230V AC 1/60 CAP-REV. 1" SH. DIA. TEBB	CS	225	CENTURY	65388(D)	\$108.00
2	1750	.....	115/230V AC EX. PROOF 1" SH. DIA. BB	BE	224	BRN. & BRK	65389(D)	\$149.00
2	1750	.....	220/440V AC 3/60 7/8" SH. DIA. OBB	CSP	184	WEST.	65390(D)	\$59.00
2	1750	.....	230V AC 1/60 REP-IND. 1-1/8" SH. OBB	BE	213	BRN. & BRK	65391(D)	\$112.00
2	1750	.....	115V DC COMPOUND 1" SH. DIA. OBB	5BA1779	224	G. E.	65392	\$190.00
2	1750	.....	115V DC COMPOUND 1" SH. DIA. OBB	HI	222416	AMERICAN	65393	\$190.00
2	1750	.....	230V DC STABILIZED SHUNT 1" SH. DIA. OBB	C	224	STAR	65394(D)	\$220.00
2	3450	.....	115/230V AC 1/60 CAP. START & RUN OBB	5KC47	J56	G. E.	65395(D)	\$89.00
2	3450	.....	115V DC SHUNT 3/4" SH. DIA. OBB	1180480	H66	WEST.	65396	\$150.00

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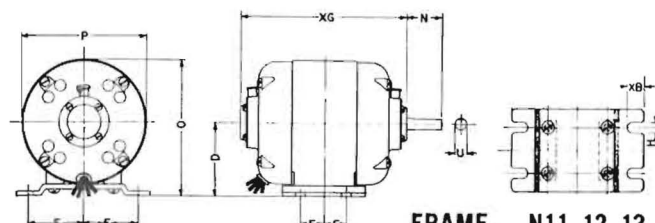
**DIMENSIONS ARE FOR ESTIMATING PURPOSES ONLY**



FRAME	C	XI	U	XH	XL	YB
K-22RM	3 37/64	1/4	.250	2 37/64	1 1/16	1 27/64
K-23RM	3 45/64	1/4	.250	2 45/64	1 1/16	1 27/64
K-26RM	4 23/64	1/4	.250	3 23/64	1 15/32	1 27/64

Diameter of Shaft subject to a maximum variation of minus .0003 inch.

\* Suitable capacitor and container of lubricant supplied with each motor.



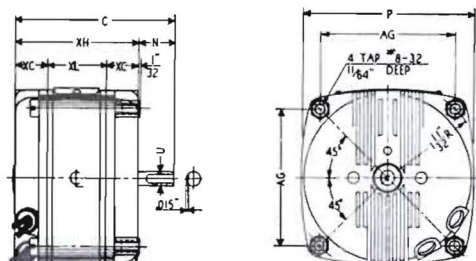
FRAME N11, 12, 13

FRAME	D		E	F	H	N	O	P	U	XB	XG ↑	XG •
	to	-1/32"										
N 11	2		1 15/32	3/8	1/4	15/16	3 1/2	3 1/2	3 11/16	7/16	4 1/2	4 1/4
N 12	2		1 15/32	3/8	1/4	15/16	3 1/2	3 1/2	3 11/16	7/16	4 3/4	4 3/4
N 13	2		1 15/32	3/8	1/4	15/16	3 1/2	3 1/2	3 11/16	7/16	5 1/8	4 7/8

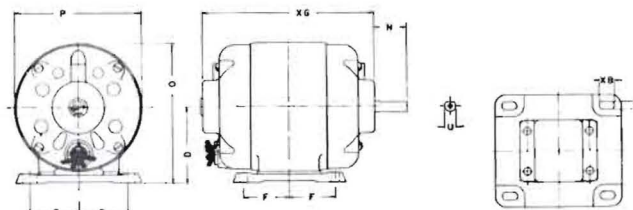
† Sleeve bearing motors only.

\* Ball bearing motors only.

\* Ball bearing motors only.



FRAME	C	N	P	U	AG	XC	XH	XL
K-23	2 $\frac{3}{8}$	$\frac{5}{8}$	2 $\frac{3}{8}$	3 $\frac{1}{16}$	1 $\frac{19}{32}$	1 $\frac{15}{32}$	1 $\frac{3}{4}$	1 $\frac{13}{16}$
K-26	3 $\frac{1}{32}$	$\frac{5}{8}$	2 $\frac{3}{8}$	3 $\frac{1}{16}$	1 $\frac{19}{32}$	1 $\frac{15}{32}$	2 $\frac{13}{32}$	1 $\frac{15}{32}$



FRAME N33, 34

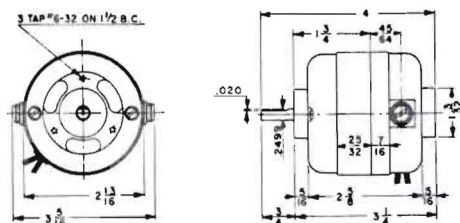
FRAME	D to -1/32"	E	F	H	N	O	P	U	XB	XG †	XG *
N 33	2 3/8	1 11/16	1 9/16	1/4	1 1/8	4 3/4	4 13/32	.3745	1/2	5 1/2	5/8
N 34	2 3/8	1 11/16	1 9/16	1/4	1 1/8	4 3/4	4 13/32	.3745	1/2	5	5/8

All dimensions apply to either sleeve or ball bearing motors except XG as noted

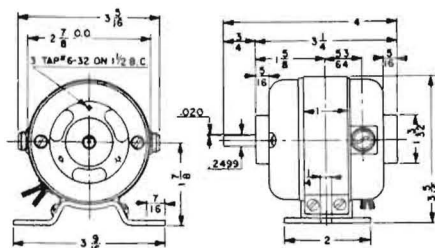
† Sleeve bearing motors only.

\* Ball bearing motors only.

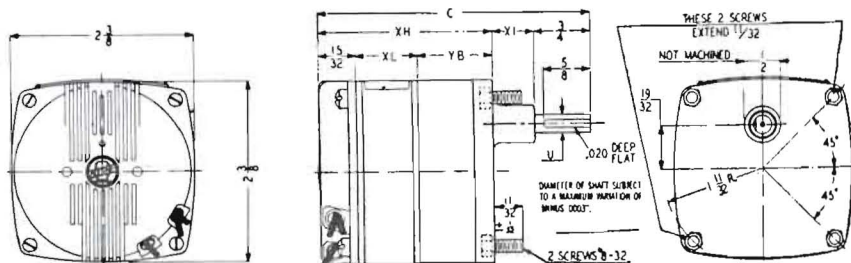
FRAME V10



The dimensional diagram above represents a round body motor without the conventional type of base mounting. It will be noted that there are three holes in the end shield tapped for three 6-32 machine screws, which provides a means for end mounting. A base is also supplied which is attached to a steel strap that fastens around the motor body.



Shaft height (17/8") subject to variation of plus or minus 1/32".



FRAME	C	XI	U	XH	XL	YB
K-22RB	3 $\frac{1}{16}$	$\frac{1}{2}$	.250	2 $\frac{3}{16}$	1 $\frac{1}{16}$	1 $\frac{1}{32}$
K-22RC	3 $\frac{1}{16}$	$\frac{1}{2}$	.250	2 $\frac{3}{16}$	1 $\frac{1}{16}$	1 $\frac{1}{32}$

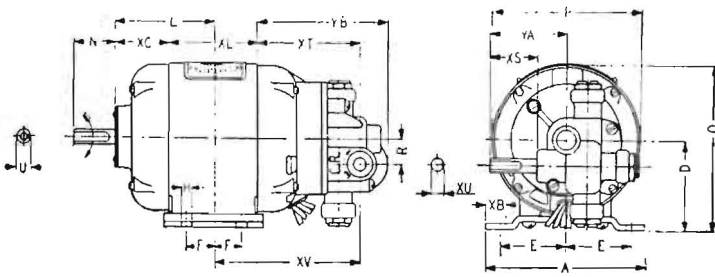
\* Suitable capacitor and container of lubricant supplied with each motor.



# BODINE MOTOR DIMENSIONS

TECHNICAL INFORMATION ON MOTORS ON PAGES 28 AND 29

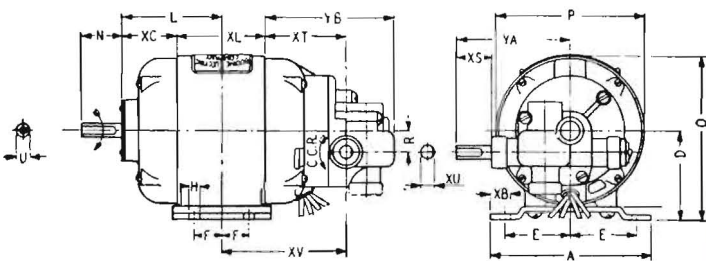
## Double reduction — group I



Frame	A	D	E	F	H	L	N	O	P	R
V-10R	3 1/16	2	1 1/32	5/8	1/4	2 1/32	...	3 1/32	2 1/16	3/16
N-11R	3 1/32	2	1 1/32	5/8	1/4	2 1/8	1 1/16	3 1/32	3 1/16	9/16
N-12R	3 1/32	2	1 1/32	5/8	1/4	2 1/4	1 1/16	3 1/32	3 1/16	9/16

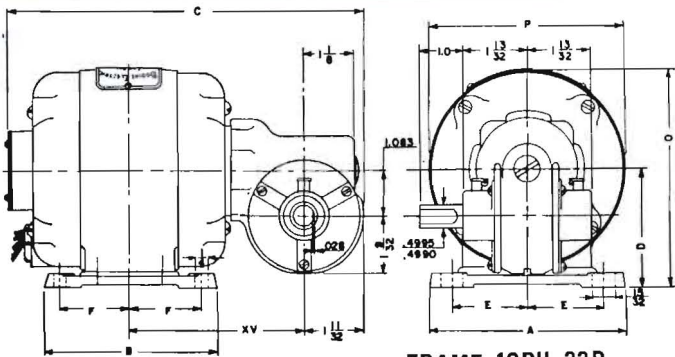
Frame	U	XB	XC	XL	XS	XT	XU	XV	YA	YB
V-10R	...	3/8	1 1/2	...	3/32	...	.312	1 1/2	1 1/8	3 1/16
N-11R	.3122	7/16	1 1/4	1 3/4	3/32	2 3/32	.312	3 3/32	1 5/8	2 29/32
N-12R	.3122	7/16	1 1/4	2	3/32	2 3/32	.312	3 3/32	1 5/8	2 29/32

## Single reduction — group I



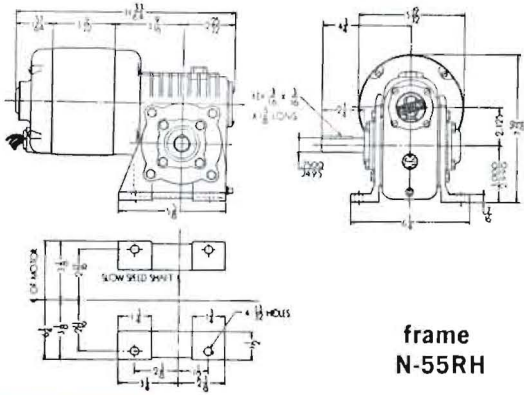
Frame	A	D	E	F	H	L	N	O	P	R
V-10R	3 1/16	2	1 1/32	5/8	1/4	2 1/32	...	3 1/32	2 1/16	15/32
N-11R	3 1/32	2	1 1/32	5/8	1/4	2 1/8	1 1/16	3 1/32	3 1/16	15/32
N-12R	3 1/32	2	1 1/32	5/8	1/4	2 1/4	1 1/16	3 1/32	3 1/16	15/32

Frame	U	XB	XC	XL	XS	XT	XU	XV	YA	YB
V-10R	...	3/8	1 1/2	...	13/16	...	.312	1 1/2	2 3/16	3 3/16
N-11R	.3122	7/16	1 1/4	1 3/4	13/16	1 13/16	.312	2 11/16	2 3/16	2 29/32
N-12R	.3122	7/16	1 1/4	2	13/16	1 13/16	.312	2 11/16	2 3/16	2 29/32



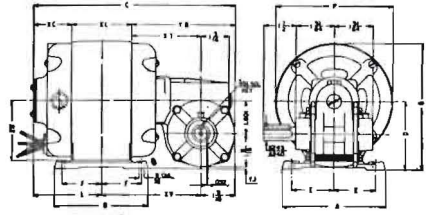
FRAME 12RH, 33R

FRAME	A	B	C	D	E	F	O	P	XV
N-12RH	3 3/8	2 1/2	7 1/2	2 7/16	1 1/32	5/8	4 1/2	3 1/2	3 1/8
N-33R	4 3/8	3 3/8	7 3/2	2 3/8	1 1/16	1 1/16	4 1/2	4 1/2	3 1/8



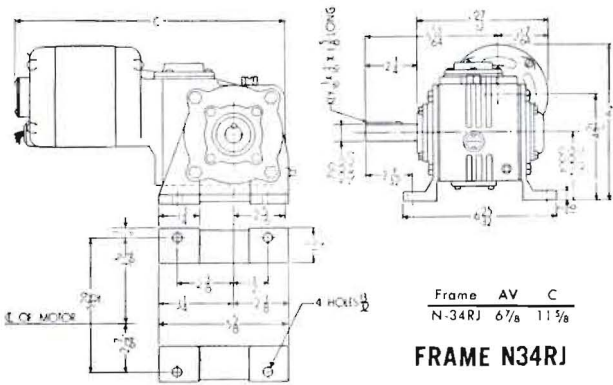
frame N-55RH

## 34RH, 53R, 54RL



Frame	A	B	C	D	E	F	L	O
N 34RH	4 3/4	3 7/8	9 1/16	3 1/4	1 1/16	1 1/16	2 1/16	5 1/2
N 53R	5 1/2	4 3/4	8 3/32	3 3/32	2	1 1/16	2 1/2	6 1/2
N 54RL	5 1/2	4 3/4	9 1/32	3 3/32	2	1 1/16	3 1/2	6 1/2

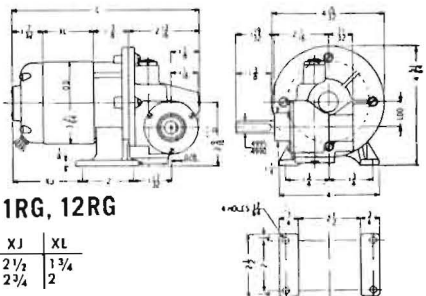
Frame	P	XC	XL	XT	XV	XW	YB	YJ
N 34RH	4 1/32	1 3/8	2 3/8	3 1/4	4 3/16	2 7/32	4 13/16	8 1/2
N 53R	5 1/32	1 13/16	2 3/8	3 3/16	4 1/2	2 13/16	4 7/8	8 1/2
N 54RL	5 1/32	1 13/16	2 3/8	3 3/16	4 1/2	2 13/16	4 7/8	8 1/2



Frame AV C  
N-34RJ 6 7/8 11 5/8  
FRAME N34RJ

## FRAME 11RG, 12RG

Frame	C	XJ	XL
N11RG	2 3/32	2 1/2	1 3/4
N12RG	2 1/32	2 3/4	2





# MASTER RIGHT ANGLE GEARMOTORS

TABLE A "A" OR "E" MOUNTING

FRAME	A	B	C	D	E	F	H	L	M	O	Q	R	U	V	KEY		BA	BB	QD	QN	QP	XC	XL	XO
															Sq.	Lgt.								
5217RW	6 <sup>1</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>8</sub>	10 <sup>3</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	6 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	2	3 <sup>1</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
F56RW	6 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	11 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>	3	1 <sup>1</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>2</sub>	7 <sup>3</sup> / <sub>4</sub>	7 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
G56RW	6 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>16</sub>	12 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>2</sub>	3	1 <sup>3</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
H56RW	6 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>16</sub>	13 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>2</sub>	3	2	2 <sup>3</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>

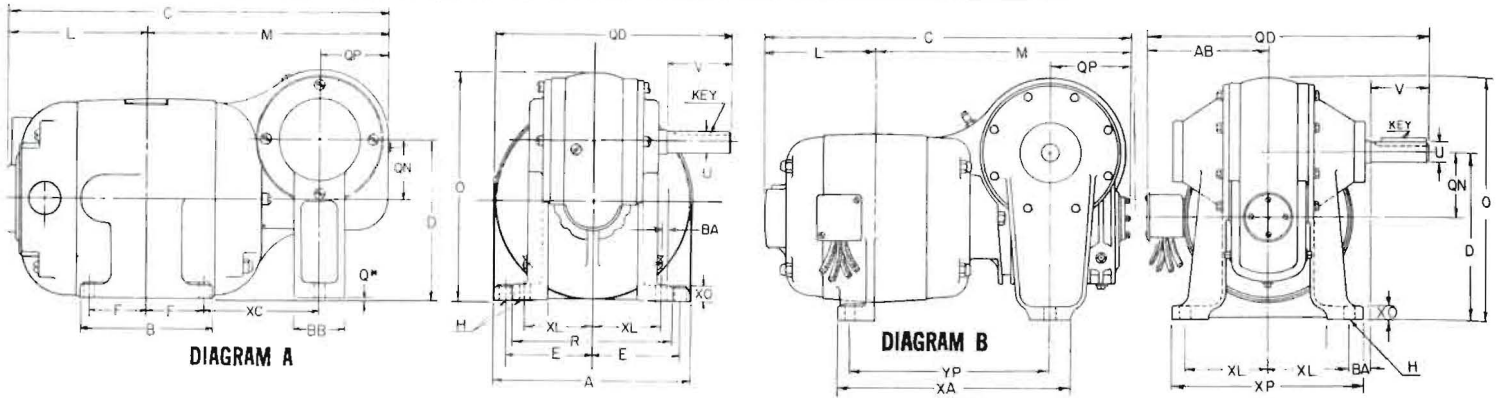
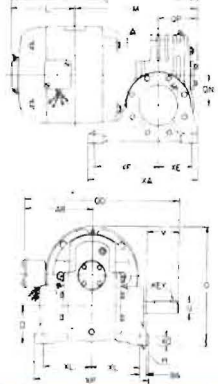


TABLE B "A" OR "E" MOUNTING

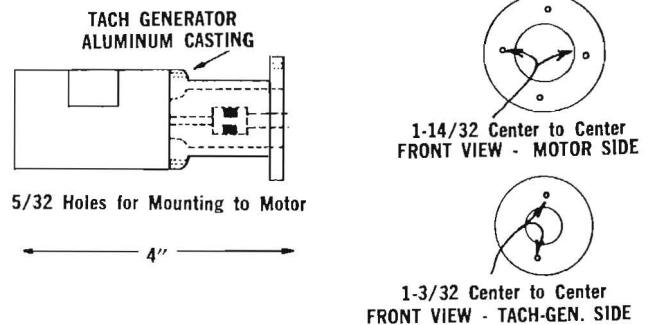
FRAMES	C	D	H	L	M	O	U	KEY		V	AB	BA	QD	QN	QP	XA	XL	XO	XP	YP
								Sq.	Lgt.											
7412RW Thru 7420RW	16 <sup>1</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	5 <sup>3</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>16</sub>	11 <sup>3</sup> / <sub>8</sub>	1	1 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	3	6 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	14 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>2</sub>	7 <sup>3</sup> / <sub>8</sub>	10 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
7422RW Thru 7430RW	17 <sup>1</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	5 <sup>7</sup> / <sub>8</sub>	11 <sup>3</sup> / <sub>16</sub>	11 <sup>3</sup> / <sub>8</sub>	1	1 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	3	6 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	14 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>2</sub>	7 <sup>3</sup> / <sub>8</sub>	10 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
203RW	17 <sup>1</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	5 <sup>7</sup> / <sub>8</sub>	11 <sup>3</sup> / <sub>16</sub>	11 <sup>3</sup> / <sub>8</sub>	1	1 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	3	6 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	14 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>2</sub>	7 <sup>3</sup> / <sub>8</sub>	10 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>4</sub>
204RW	18 <sup>1</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	6 <sup>3</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>16</sub>	11 <sup>3</sup> / <sub>8</sub>	1	1 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	3	6 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	14 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>2</sub>	7 <sup>3</sup> / <sub>8</sub>	10 <sup>3</sup> / <sub>4</sub>	9 <sup>3</sup> / <sub>4</sub>
224RW	22 <sup>1</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	6 <sup>3</sup> / <sub>4</sub>	15 <sup>3</sup> / <sub>8</sub>	14 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	7 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	16 <sup>7</sup> / <sub>8</sub>	4	4 <sup>3</sup> / <sub>4</sub>	14 <sup>1</sup> / <sub>2</sub>	5	7 <sup>3</sup> / <sub>8</sub>	11 <sup>3</sup> / <sub>4</sub>	12 <sup>3</sup> / <sub>8</sub>
225RW	22 <sup>7</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>	15 <sup>3</sup> / <sub>4</sub>	14 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	7 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	16 <sup>7</sup> / <sub>8</sub>	4	4 <sup>3</sup> / <sub>4</sub>	14 <sup>1</sup> / <sub>2</sub>	5	7 <sup>3</sup> / <sub>8</sub>	11 <sup>3</sup> / <sub>4</sub>	12 <sup>3</sup> / <sub>8</sub>

"K" OR "L" MOUNTING



FRAME	C	D	H	L	M	O	KEY		U	V	AB	BA	QD	QN	QP	XA	XE	XF	XL	XO	XP
							Sq.	Lgt.													
F56 RW	13 $\frac{1}{8}$	3	$\frac{7}{16}$	4 $\frac{1}{8}$	7 $\frac{3}{4}$	8 $\frac{13}{16}$	$\frac{3}{16}$	1 $\frac{3}{4}$	$\frac{3}{4}$	2 $\frac{1}{4}$	No Conduit	$\frac{7}{8}$	9 $\frac{3}{4}$	2 $\frac{1}{16}$	2 $\frac{3}{8}$	7 $\frac{3}{4}$	3	3	3	$\frac{9}{16}$	7 $\frac{1}{4}$
G56 RW	13 $\frac{11}{16}$	3	$\frac{7}{16}$	4 $\frac{13}{32}$	8 $\frac{1}{2}$	8 $\frac{13}{32}$	$\frac{3}{16}$	1 $\frac{3}{4}$	$\frac{3}{4}$	2 $\frac{1}{4}$		$\frac{7}{8}$	9 $\frac{3}{4}$	2 $\frac{1}{16}$	2 $\frac{3}{8}$	7 $\frac{3}{4}$	3	3	3	$\frac{9}{16}$	7 $\frac{1}{4}$
H56 RW	14 $\frac{1}{16}$	3	$\frac{7}{16}$	4 $\frac{23}{32}$	8 $\frac{13}{16}$	8 $\frac{13}{16}$	$\frac{3}{16}$	1 $\frac{3}{4}$	$\frac{3}{4}$	2 $\frac{1}{4}$		$\frac{7}{8}$	9 $\frac{3}{4}$	2 $\frac{1}{16}$	2 $\frac{3}{8}$	7 $\frac{3}{4}$	3	3	3	$\frac{9}{16}$	7 $\frac{1}{4}$
J56 RW	15 $\frac{1}{16}$	3	$\frac{7}{16}$	5 $\frac{1}{32}$	8 $\frac{21}{32}$	8 $\frac{13}{16}$	$\frac{3}{16}$	1 $\frac{3}{4}$	$\frac{3}{4}$	2 $\frac{1}{4}$		$\frac{7}{8}$	9 $\frac{3}{4}$	2 $\frac{1}{16}$	2 $\frac{3}{8}$	7 $\frac{3}{4}$	3	3	3	$\frac{9}{16}$	7 $\frac{1}{4}$
7412 to 7420RW	16 $\frac{1}{16}$	3 $\frac{3}{8}$	$\frac{13}{32}$	5 $\frac{1}{16}$	10 $\frac{11}{16}$	10 $\frac{3}{8}$	$\frac{1}{4}$	2 $\frac{1}{4}$	1	3	6 $\frac{3}{8}$	$\frac{5}{8}$	14 $\frac{1}{2}$	2 $\frac{1}{16}$	3 $\frac{1}{16}$	10 $\frac{1}{4}$	3	6	4 $\frac{1}{2}$	$\frac{7}{8}$	10 $\frac{3}{4}$
7422 to 7430RW	17 $\frac{1}{16}$	3 $\frac{3}{8}$	$\frac{13}{32}$	5 $\frac{13}{16}$	11 $\frac{1}{16}$	10 $\frac{3}{8}$	$\frac{1}{4}$	2 $\frac{1}{4}$	1	3	6 $\frac{3}{8}$	$\frac{5}{8}$	14 $\frac{1}{2}$	2 $\frac{1}{16}$	3 $\frac{1}{16}$	10 $\frac{1}{4}$	3	6	4 $\frac{1}{2}$	$\frac{7}{8}$	10 $\frac{3}{4}$
7432 to 7440RW	18 $\frac{1}{16}$	3 $\frac{3}{8}$	$\frac{13}{32}$	6 $\frac{1}{16}$	11 $\frac{11}{16}$	10 $\frac{3}{8}$	$\frac{1}{4}$	2 $\frac{1}{4}$	1	3	6 $\frac{3}{8}$	$\frac{5}{8}$	14 $\frac{1}{2}$	2 $\frac{1}{16}$	3 $\frac{1}{16}$	10 $\frac{1}{4}$	3	6	4 $\frac{1}{2}$	$\frac{7}{8}$	10 $\frac{3}{4}$
N203RW	17 $\frac{1}{16}$	3 $\frac{3}{8}$	$\frac{13}{32}$	5 $\frac{13}{16}$	11 $\frac{1}{16}$	10 $\frac{3}{8}$	$\frac{1}{4}$	2 $\frac{1}{4}$	1	3	6 $\frac{3}{8}$	$\frac{5}{8}$	14 $\frac{1}{2}$	2 $\frac{1}{16}$	3 $\frac{1}{16}$	10 $\frac{1}{4}$	3	6	4 $\frac{1}{2}$	$\frac{7}{8}$	10 $\frac{3}{4}$
N204RW	18 $\frac{1}{16}$			6 $\frac{1}{16}$	11 $\frac{11}{16}$																
224RW	22 $\frac{3}{8}$	5	1 $\frac{7}{8}$	6 $\frac{3}{4}$	15 $\frac{3}{8}$	14 $\frac{1}{2}$	$\frac{1}{4}$	2 $\frac{3}{4}$	1 $\frac{1}{4}$	3 $\frac{3}{8}$	7 $\frac{3}{16}$	1 $\frac{1}{16}$	16 $\frac{7}{8}$	4	4 $\frac{3}{4}$	13 $\frac{3}{8}$	4 $\frac{1}{2}$	7 $\frac{3}{4}$	5	$\frac{7}{8}$	10 $\frac{3}{4}$
225RW	23 $\frac{3}{8}$			7 $\frac{1}{8}$	15 $\frac{3}{4}$																

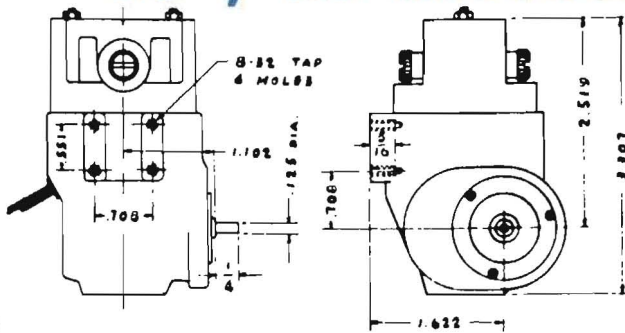
TACHOMETER AND MOUNTING DIMENSIONS



TACHOMETER GENERATOR

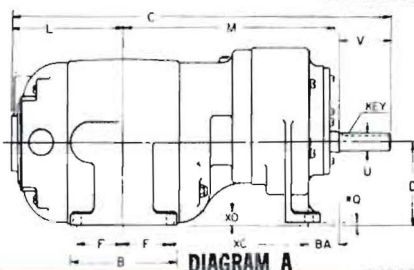
The B.B. Motor and Control Corp. Tachometer Generator provides a D.C. output voltage that is directly proportional to the speed of the motor, thus permitting the speed of the motor to be read from a calibrated voltmeter. The above dimension should be added to the overall length of the motor used.

## M107D6 , D7 , D9 MOTORS

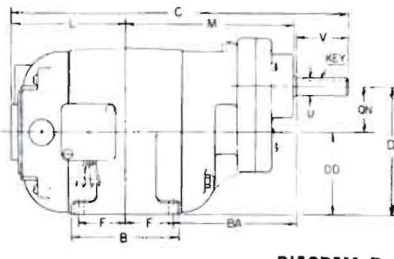
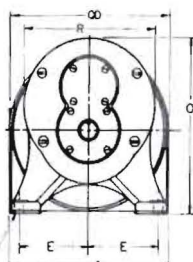




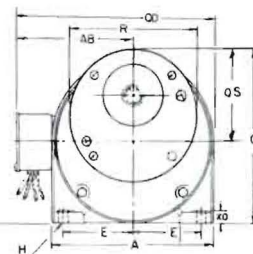
**DIMENSIONS ARE FOR ESTIMATING PURPOSES ONLY**



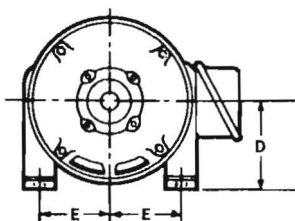
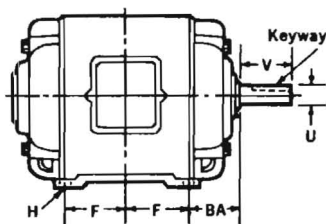
**DIAGRAM A**



**DIAGRAM B**



## NEW AND OLD NEMA FRAMES

TABLE A

FRAME	A	B	C	D	E	F	H	L	M	O	Q	R	U	V	KEY		BA	QD	XC	XO
															Sq.	Lgt.				
F56DP	67 <sub>3</sub>	31 <sub>1</sub>	14 <sub>13</sub>	3 <sub>10</sub>	3	11 <sub>10</sub>	23 <sub>10</sub>	41 <sub>10</sub>	81 <sub>10</sub>	71 <sub>10</sub>	3 <sub>6</sub>	53 <sub>6</sub>	3 <sub>6</sub>	21 <sub>6</sub>	1 <sub>10</sub>	13 <sub>6</sub>	11 <sub>6</sub>	61 <sub>6</sub>	61 <sub>6</sub>	1 <sub>6</sub>
G56DP	67 <sub>3</sub>	31 <sub>1</sub>	15 <sub>12</sub>	3 <sub>10</sub>	3	11 <sub>10</sub>	23 <sub>10</sub>	41 <sub>10</sub>	81 <sub>10</sub>	71 <sub>10</sub>	3 <sub>6</sub>	53 <sub>6</sub>	3 <sub>6</sub>	21 <sub>6</sub>	1 <sub>10</sub>	13 <sub>6</sub>	11 <sub>6</sub>	61 <sub>6</sub>	6	1 <sub>6</sub>
H56DP	67 <sub>3</sub>	41 <sub>10</sub>	16 <sub>14</sub>	3 <sub>10</sub>	3	2	11 <sub>10</sub>	51 <sub>10</sub>	91 <sub>10</sub>	71 <sub>10</sub>	3 <sub>6</sub>	53 <sub>6</sub>	3 <sub>6</sub>	21 <sub>6</sub>	1 <sub>10</sub>	13 <sub>6</sub>	11 <sub>6</sub>	61 <sub>6</sub>	6	1 <sub>6</sub>
J56DP	67 <sub>3</sub>	41 <sub>10</sub>	17 <sub>14</sub>	3 <sub>10</sub>	3	2	11 <sub>10</sub>	51 <sub>10</sub>	91 <sub>10</sub>	71 <sub>10</sub>	3 <sub>6</sub>	53 <sub>6</sub>	3 <sub>6</sub>	21 <sub>6</sub>	1 <sub>10</sub>	13 <sub>6</sub>	11 <sub>6</sub>	61 <sub>6</sub>	6	1 <sub>6</sub>

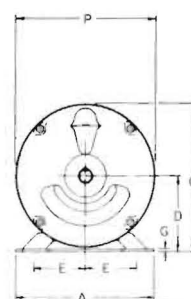
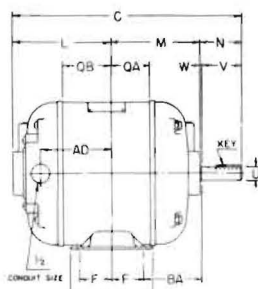
TABLE B

FRAME	A	B	C	D	E	F	H	L	M	O	O'	R	U	V	KEY		AB	BA	DD	QD	QN	QS	QV	XO
															Seq.	Let.								
5210SP Thru 5217SP	6 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	No Condulet	4 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>
5220SP 5222SP	6 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>		4 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>
F56SP	6 <sup>3</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	3	1 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>		5 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	2	1 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>
G56SP	6 <sup>7</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	3	1 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	6 <sup>7</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>		5 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	2	1 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>
H56SP	6 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	14 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	3	2	1 <sup>5</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>		5 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	2	1 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>
J56SP	6 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	3	2	1 <sup>5</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>		5 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	2	1 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>
7412SP Thru 7420SP	8 <sup>1</sup> / <sub>8</sub>	5	16 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>8</sub>	1	3	1 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>
7422SP Thru 7430SP	8 <sup>1</sup> / <sub>8</sub>	6	17 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>8</sub>	1	3	1 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>
7432SP Thru 7440SP	8 <sup>1</sup> / <sub>8</sub>	6	18 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>8</sub>	1	3	1 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>
203SP	9 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	17 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	4	2 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>8</sub>	1	3	1 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	5	11	2 <sup>3</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>
2043P	9 <sup>1</sup> / <sub>8</sub>	7 <sup>3</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	4	3 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>8</sub>	1	3	1 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	5	11	2 <sup>3</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>
2249P	10 <sup>1</sup> / <sub>8</sub>	8	20 <sup>1</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>8</sub>	10 <sup>3</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	1	3	1 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>
2258SP	10 <sup>1</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>8</sub>	21 <sup>1</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>8</sub>	10 <sup>3</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>8</sub>	1	3	1 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>
2549P	12 <sup>1</sup> / <sub>8</sub>	10	25 <sup>1</sup> / <sub>8</sub>	10	5	4 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>8</sub>	14 <sup>1</sup> / <sub>8</sub>	12 <sup>3</sup> / <sub>8</sub>	11 <sup>7</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	14 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>

Frame	Keyway	BA	D	E	F	H	U	V
48	¼"-Flat	2½	3	2¼	1½	1½x1½ (Slot)	½	1½
56	⅛x⅓x2	2¼	3½	2⅛	1½	1½x1½x2 (Slot)	¾	1½
56Z	¼"-Flat	2¼	3½	2⅛	1½	1½x1½x2 (Slot)	½	1½
66	3/16x3/32	3-1/8	4-1/8	2 15/16	2-3/4	11/32x1/2	3/4	2 11/32
182	⅛x⅓x2	2¼	4½	3¾	2¼	1½x2	⅞	2
184					2¼			
203	⅛x⅓x2	3¾	5	4	2¾	1½x2	¾	2
204					3¾			
213	¼x⅓	3½	5¼	4¼	2¾	1½x2	1½	2¾
215					3¾			
224	¼x⅓	3½	5½	4½	3¾	1½x2	1	2¾
242S								
254	¼x⅓	4¼	6¼	5	4¼	1½x2	1½	3¾
254U	⅛x⅓x2	4¼	6¼	5	4¼	1½x2	1½	3½
256U					5			
284	¼x⅓	4¼	7	5½	4¼	1½x2	1½	3½
284U	⅓x⅓x⅓	4¼	7	5½	4¼	1½x2	1½	4¾
286U					5½			
324	⅓x⅓x⅓	5¼	8	6¼	5¼	2½x2	1¾	4¾
324S							¾	3
324U	½x¼	5¼	8	6¼	5¼	2½x2	1¾	5¾
326	⅓x⅓x⅓	5¼	8	6¼	6	2½x2	1½	4¾
326S							¾	3
326U	½x¼	5¼	8	6¼	6	2½x2	1½	5¾
364	½x¼	5¾	9	7	5¾	2½x2	1½	5¾
364S	½x2⅛						1¾	3
364U	½x¼	5¾	9	7	5¾	2½x2	1½	6¾
364U							2¾	3½
364Z	⅓x⅓	5¾	9	7	5¾	2½x2	2¾	4
364ZS	½x½	5¾	9	7	5¾	2½x2	2¾	6
365	½x¼	5¾	9	7	6¼	2½x2	1½	5¾
365S	⅓x2⅛						1¾	3
365U	½x¼	5¾	9	7	6¼	2½x2	1½	6¾
365U							2¾	3½
365Z	⅓x⅓	5¾	9	7	6¼	2½x2	2¾	6
365ZS	½x½	5¾	9	7	6¼	2½x2	2¾	6
404	½x¼	6¼	10	8	6¼	1¾x16	2¾	6¾
404S							1¾	3¾
73	3/16x3/32	3-1/8	4 5/8	3 1/4	2-1/2	13/32x1 1/2	3/4	2 1/4

## STANDARD NEMA FRAMES

### FRACTIONAL HORSE POWER , NON - GEARED MOTOR DIMENSIONS

[illegible]



FORMULAE--CHARTS--TABLES

Ohms Law:

Volts  
 Amperes = ————— Ohms = ————— Volts = Amperes x Ohms  
 Ohms Amperes

Power in D.C. Circuits: Watts = Volts x Amperes;

Horsepower = ————— Volts x Amperes Kilowatts = ————— Volts x Amperes  
 746 1000

Kilowatt-Hours = ————— Volts x Amperes x Hours  
 1000

Power in A.C. Circuits: Kilovolt-Amperes (Kva) = ————— Volts x Amperes  
 1000

Kilowatt (Kw) = ————— Volts x Amperes x Power Factor  
 1000

Power Factor = ————— Kilowatts  
 Kilovolts x Amperes

Two-Phase Kw = ————— Volts x Amperes x Power Factor x 1.42  
 1000

Three-Phase Kw = ————— Volts x Amperes x Power Factor x 1.73  
 1000

T = torque or twisting moment

= 3.1416

N = revolutions per minute

HP = horsepower (33,000 ft.-lbs. per min.)

R = radius of pulley, in feet

E = input voltage

I = current in amperes

P = power input in watts

W = weight, lbs.

HP = ————— 2πR x N x W = ————— T (in.-lb.) x N  
 33,000 63,025

HP = T (in.-oz.) x 9.93 x N x 10<sup>-7</sup> = (approx.) T (in.-oz.) x N x 10<sup>-6</sup>

P = EI x power factor = ————— HP x 746  
 motor efficiency

POWER TO DRIVE PUMPS:

HP = ————— Gal. per min. x Total Head (inc. friction)  
 3,960 x eff. of pump

Where:

Approx. friction head (ft.) = ————— pipe length (ft.) x [velocity of flow (ft./sec.)]<sup>2</sup> 0.02  
 5.367 x diameter (in.)

Eff. Approx. 0.50 to 0.85

TIME TO CHANGE SPEED OF ROTATING MASS:

WR<sup>2</sup> = change in rpm

Time (sec.) = ————— 308 x torque (ft.-lb.)

Where, WR<sup>2</sup> (disc) = ————— Weight (lbs.) x [radius (ft.)]<sup>2</sup>  
 2

WR<sup>2</sup> (rim) = ————— W<sub>r</sub> (lbs.) x [outer radius in ft.]<sup>2</sup> + inner radius in ft.]<sup>2</sup>  
 2

INERTIA I (lb.-in.<sup>2</sup>) = ————— WR<sup>2</sup> 32

I (oz.-in.<sup>2</sup>) = 6 x WR<sup>2</sup> (lb.-in.<sup>2</sup>)

POWER TO DRIVE FANS:

HP = ————— Cu. ft. air per min. x water gage pressure (in.)  
 6,350 x Eff.

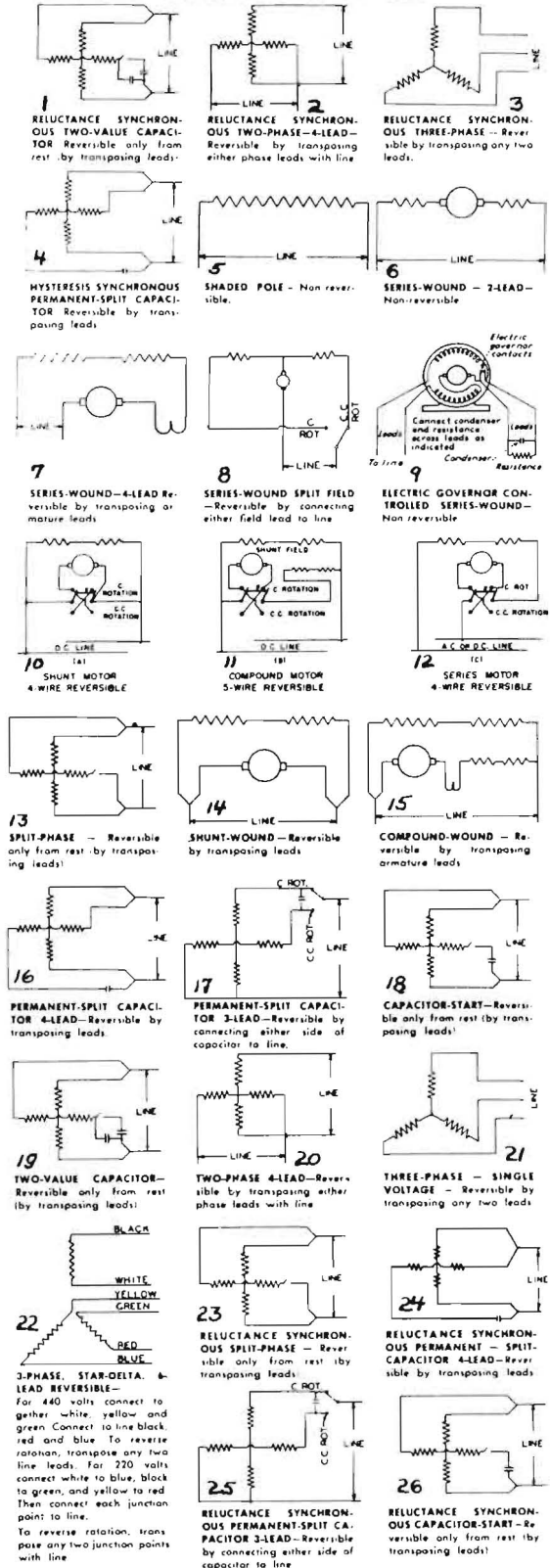
12.4-TORQUE AND WATT OUTPUT RATINGS

HORSEPOWER	WATTS					FULL LOAD TORQUES IN. OZ.									
	1/2 LOAD	FULL LOAD	3/4 LOAD	1/2 LOAD	1/4 LOAD	1125 RPM	1725 RPM	3450 RPM	4000 RPM	5000 RPM	6000 RPM	7000 RPM	8000 RPM	9000 RPM	10000 RPM
1/200	0.005	3.59	2.79	1.86	0.47	2.41	1.55	1.26	1.01	0.83	0.71	0.61	0.52	0.44	0.37
1/150	0.006	2.65	2.02	1.35	0.34	1.83	1.14	0.96	0.78	0.64	0.54	0.46	0.39	0.32	0.27
1/100	0.010	1.76	1.37	0.90	0.23	1.36	0.84	0.72	0.58	0.48	0.40	0.34	0.28	0.23	0.19
1/75	0.013	1.33	1.02	0.68	0.18	1.02	0.63	0.54	0.43	0.36	0.30	0.25	0.20	0.16	0.13
1/50	0.020	0.90	0.68	0.45	0.12	0.70	0.43	0.37	0.30	0.24	0.20	0.16	0.13	0.10	0.08
1/40	0.025	0.72	0.55	0.37	0.10	0.56	0.35	0.30	0.24	0.19	0.16	0.13	0.10	0.08	0.06
1/30	0.030	0.60	0.45	0.30	0.08	0.47	0.29	0.25	0.20	0.16	0.13	0.10	0.08	0.06	0.05
1/25	0.036	0.52	0.39	0.26	0.07	0.40	0.25	0.21	0.17	0.13	0.11	0.09	0.07	0.05	0.04
1/20	0.040	0.45	0.34	0.22	0.06	0.35	0.22	0.19	0.15	0.12	0.10	0.08	0.06	0.05	0.04
1/15	0.050	0.36	0.27	0.18	0.05	0.28	0.17	0.15	0.12	0.09	0.07	0.06	0.05	0.04	0.03
1/12	0.060	0.30	0.22	0.15	0.04	0.23	0.14	0.12	0.10	0.08	0.06	0.05	0.04	0.03	0.02
1/10	0.070	0.25	0.18	0.12	0.03	0.20	0.12	0.10	0.08	0.06	0.05	0.04	0.03	0.02	0.02
1/8	0.080	0.20	0.15	0.10	0.03	0.17	0.10	0.08	0.07	0.05	0.04	0.03	0.02	0.02	0.01
1/6	0.100	0.15	0.11	0.07	0.02	0.14	0.08	0.07	0.06	0.04	0.03	0.02	0.02	0.01	0.01
1/5	0.120	0.12	0.09	0.06	0.02	0.11	0.07	0.06	0.05	0.04	0.03	0.02	0.02	0.01	0.01
1/4	0.150	0.10	0.07	0.05	0.01	0.09	0.05	0.04	0.03	0.03	0.02	0.02	0.01	0.01	0.01
1/3	0.180	0.08	0.06	0.04	0.01	0.07	0.04	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01
1/2	0.200	0.07	0.05	0.03	0.01	0.06	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
1/1.5	0.220	0.06	0.04	0.03	0.01	0.05	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1/1.2	0.250	0.05	0.04	0.02	0.01	0.04	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1/1.1	0.270	0.04	0.03	0.02	0.01	0.04	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1/1.0	0.300	0.04	0.03	0.02	0.01	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1/0.9	0.330	0.03	0.02	0.02	0.01	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1/0.8	0.360	0.03	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1/0.7	0.400	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1/0.6	0.450	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1/0.5	0.500	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1/0.4	0.550	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1/0.3	0.600	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1/0.2	0.650	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1/0.1	0.700	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

WATTS (INPUT POWER) = ————— WATTS (OUT)  
 EFFICIENCY

Reprinted from the Bodine Motor Handbook, 2nd Ed. This 113 page book is full of useful information. Copies are available from B & B Motor and Control Corp. at \$1.00 or free with orders over \$100 upon request.

CONNECTION DIAGRAMS



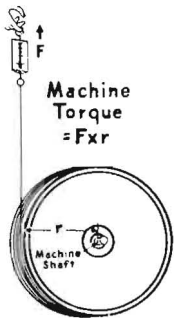


2.7- TORQUE MEASUREMENT OF A MACHINE

The size and class of a motor required to drive any given machine depends on the machine's torque characteristics. The torque required to operate a machine may be different between the stages of starting from standstill, accelerating, and running at normal speed. It may also vary over a cycle of operation during the running stage. Since the horsepower of a motor is the product of running torque and normal running speed, the horsepower required can be determined only when the running torque is known. Different classes of motors develop different ratios of starting and accelerating torques to their running torque. Therefore, the class of motor to select for a particular application can be determined only when starting and accelerating torques are known. The accelerating torque required to drive a machine will exceed the starting torque only when inertia (such as a flywheel), or windage (such as a fan or blower) factors are predominantly inherent in the machine. Then the accelerating torque is computed on the basis of the time which can be allowed to accelerate from standstill to full speed.

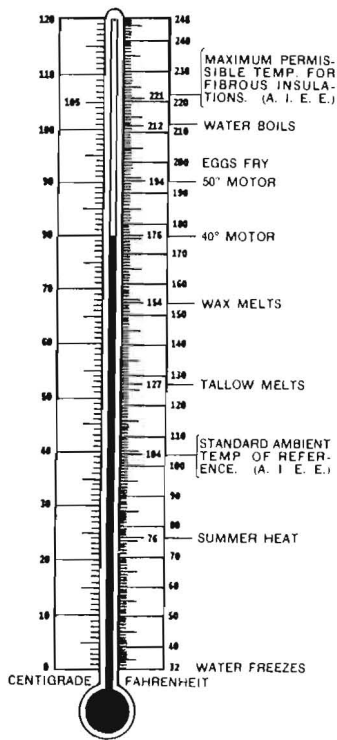
The starting torque required to drive a machine may be measured as follows. Fasten a pulley rigidly to the shaft which the motor is to drive. Secure one end of a cord to the outer surface of the pulley and wrap a few turns of the cord around the pulley. Tie the other end of the cord to a spring scale. Pull on the scale until the shaft turns. The force in pounds indicated on the scale, multiplied by the radius of the pulley in inches, gives the torque or twisting effort in inch-pounds. (If the scale is read in ounces, the result is in inch-ounces.) When the torque characteristics of the machine are such as to vary in different parts of the operating cycle, the starting torque must be determined at that point where it is greatest.

The running torque required by a machine will be approximately equal to the starting torque if the load is composed almost entirely of friction. If the load is primarily inertia or windage, the characteristics of the inertia or windage producing elements must be known. Fan and blower manufacturers usually publish this kind of data on their products.



The running torque of a machine can be determined accurately by making a test run with a motor of known characteristics and reserve power. Under normal rated voltage, read the motor input on an ammeter. The maximum ampere reading can be spotted on the characteristics chart of the motor, and the corresponding torque noted. Motor manufacturers can usually make this kind of data available.

TEMPERATURE CHART  
Centigrade and Fahrenheit Scales



This chart may be used to convert from degrees F. to degrees C. or vice versa. It also indicates that properly operating motors may often reach temperatures uncomfortable to the hand.

12.3- HORSE POWER - TORQUE CHART

TABLE OF INCH-OUNCE TORQUE FOR GIVEN HORSEPOWER AT VARIOUS SPEEDS

H P	DECIMAL	R.P.M															
		1125	1200	1425	1500	1725	1800	3000	3450	3600	5000	7500	10,000				
1/2000	.00050	0.15	0.12	0.26	0.34	0.29	0.28	0.17	0.15	0.14	0.10	0.07	0.053				
1/1500	.00067	0.60	0.56	0.17	0.45	0.39	0.37	0.22	0.20	0.19	0.13	0.09	0.071				
1/1000	.00100	0.90	0.84	0.71	0.67	0.59	0.56	0.34	0.29	0.28	0.20	0.11	0.09				
1/750	.00133	1.2	1.12	0.94	0.90	0.78	0.75	0.45	0.39	0.37	0.27	0.16	0.13				
1/500	.0020	1.8	1.68	1.42	1.35	1.17	1.12	0.67	0.58	0.56	0.40	0.27	0.21				
1/200	.0050	4.5	4.2	3.6	3.4	2.93	2.8	1.68	1.46	1.4	1.01	0.67	0.503				
1/150	.00667	6.0	5.6	4.7	4.5	3.9	3.7	2.24	1.95	1.87	1.35	0.90	0.671				
1/100	.0100	9.0	8.4	7.1	6.7	5.9	5.6	3.4	2.93	2.81	2.02	1.35	1.01				
1/75	.0133	12.0	11.2	9.4	9.0	7.8	7.5	4.5	3.9	3.7	2.69	1.8	1.35				
1/70	.0143	12.8	12.0	10.1	9.62	8.35	8.0	4.81	4.17	4.0	2.89	1.92	1.44				
1/60	.0167	15.0	14.0	11.8	11.2	9.8	9.4	5.6	4.9	4.7	3.4	2.24	1.68				
1/50	.020	18.0	16.8	14.2	13.5	11.7	11.2	6.7	5.8	5.6	4.0	2.69	2.01				
1/40	.025	22.4	21.0	17.7	16.8	14.6	14.0	8.4	7.3	7.0	5.0	3.4	2.52				
1/30	.0333	28.8	28.0	23.6	22.1	19.5	18.7	11.2	9.8	9.4	6.7	4.5	3.35				
1/25	.040	35.9	33.7	28.4	26.9	23.4	22.4	13.5	11.7	11.2	8.1	5.6	4.03				
1/20	.050	44.9	42.1	35.6	33.7	29.3	28.0	16.8	14.6	14.0	10.1	6.7	5.03				
1/15	.0667	59.8	56.1	47.3	44.9	39.0	37.4	22.4	19.5	18.7	13.5	9.0	6.71				
1/12	.0834	74.8	70.1	59.0	56.1	48.8	46.8	28.1	24.4	23.1	16.8	11.2	8.4				
1/10	.100	89.8	84.1	70.8	67.3	58.6	56.1	33.6	29.3	28.1	20.2	13.5	10.1				
1/8	.125	112.0	105.0	88.6	84.1	73.2	70.0	42.1	36.6	35.1	25.2	16.8	12.6				
1/6	.167	150.0	140.0	118.0	112.0	97.6	93.5	56.1	48.8	46.8	33.7	22.4	16.8				
1/4	.250	224.0	210.0	177.0	168.0	146.0	140.0	84.1	73.1	70.1	50.5	33.7	25.2				
1/3	.333	299.0	280.0	236.0	224.0	195.0	187.0	112.0	97.7	93.6	67.3	44.9	33.7				

2.5- MOTOR CHARACTERISTIC CHART

		SPLIT PHASE		SHADE POLE		SYNCHRONOUS SPLIT PHASE		SYNCHRONOUS CAPACITOR START		SYNCHRONOUS 2 VALUE CAPACITOR		T. VALUE CAPACITOR		SERIES 4 LEAD		SERIES 2 LEAD		3 PHASE MOTOR CONTROL	
		START OR COMPASS	REVERSE	START	REVERSE	START	REVERSE	START	REVERSE	START	REVERSE	START	REVERSE	START	REVERSE	START	REVERSE	START	REVERSE
CURRENT	A.C.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	D.C.	X																	
DUTY	CONTINUOUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	INTERMITTENT																		
UNIDIRECTIONAL			X																
REVERSIBLE AT REST ONLY		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SPEED	CONSTANT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	ADJUST	X																	
	VARIABLE																		
STARTING TORQUE	LOW		X					X	X	X	X	X	X						
	NORMAL	X	X		X														
	HIGH			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
STARTING CURRENT	LOW		X					X	X	X	X	X	X						
	NORMAL	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	HIGH																		

① UNDER FAVORABLE CONDITIONS  
② HIGH WITH FULL LOAD SPEED ABOVE 7500 R.P.M.  
③ LOWER THAN FOR SPLIT PHASE





# Geartronics APCOR

## SERIES 2400 MULTIRATIO SPEED REDUCER

Featuring the exclusive Turn-Only Ratio Selector\* no push — no pull!

4 1/2" square X only  
3 1/2" deep.

Turn Only to any one of the 10 ratios you want . . . shifts in either direction.

Color now added! The standard case color is semi-gloss aqua blue while the Ratio Selector and Ratio Dial are black. If customers desire, they may request special colors.

APCOR Multiratio Speed Reducers can be front, back or base mounted.

Adaptation to mechanical or electrical remote control is greatly simplified.

APCOR Multiratio Speed Reducers are permanently lubricated.

Model No.	Ratios										
2401	1,	2,	5,	10,	20,	50,	100,	200,	500,	&	1000 to 1
2402	1,	2.5,	5,	10,	25,	50,	100,	250,	500,	&	1000 to 1
2403	1,	2,	4,	8,	16,	32,	64,	128,	256,	&	512 to 1
2404	1,	2,	3,	5,	10,	20,	30,	50,	100,	&	200 to 1
2405	1,	2,	3,	4,	5,	10,	20,	30,	40,	&	50 to 1
2406	1,	2,	3,	4,	5,	6,	7,	8,	9,	&	10 to 1
2407	1,	0.9,	0.8,	0.7,	0.6,	0.5,	0.4,	0.3,	0.2,	&	0.1 to 1
											PRICE
											\$125.00

- **Load Conditions:** The recommended maximum torque of the multiratio gear train is 100 inch ounces under continuous load. However, under intermittent or low speed load conditions the allowable torque may be safely increased. On these and other high inertia and/or high impact load installations, we suggest you contact our engineering department.
- **Anti-Backlash:** A special electrically operated reversing unit, which will eliminate all backlash, is available for attachment either directly to the APCOR Multiratio Speed Reducer or to the driven shaft somewhere between the Speed Reducer and its driven load.

- **Special Ratios:** Other ratios to meet your particular requirements can be provided on special order.
- **Motor Attachment:** Standard models above are not provided with motor attached. However, provision has been made for motor mounting, which can be provided on special order.
- **Without Housing:** Standard or special units are also available without the housing, in production quantity on special order, for installation in your existing system.

DIMENSIONS ARE ON TOP OF PG. 32

### HERE'S HOW YOU CAN USE THE APCOR 2400 10-RATIO SPEED REDUCER

- 1 Use with any synchronous or constant speed motor or gearmotor to obtain 10 discrete, exactly reproducible output speeds.
- 2 Use any combination of motor and Heller control to provide infinitely variable speed control within each of the 10 Apcor ratios or any speed within a 30,000 to 1 speed range.



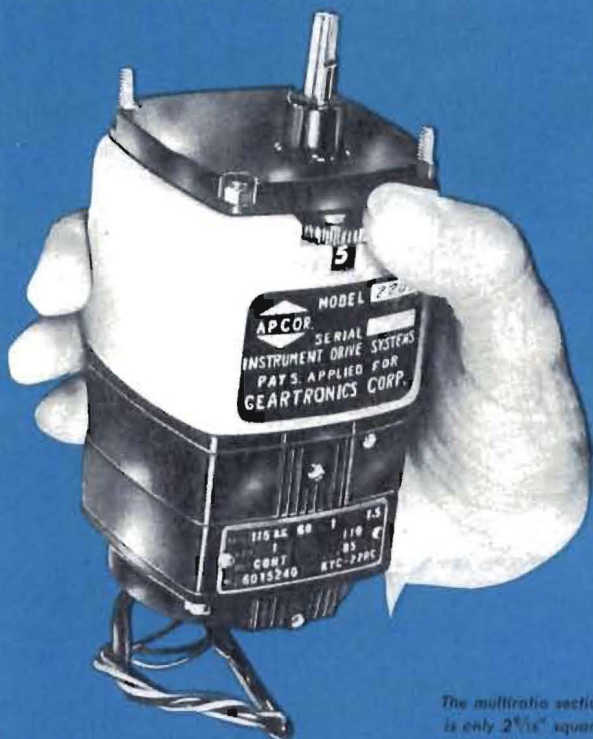
Geartronics

APCOR

SERIES 2200 DIAL  
OPERATED MULTIRATIO

GEARMOTORS

No push — No pull — Turn only!



The multiratio section  
is only 2 1/8" square  
x 2" long.

\*Patent Pending

Just the touch of your thumb dials any one of the six ratios you want — easily but surely and in either direction!

Exclusive "Turn Only" feature greatly simplifies the adaptation of mechanical or electrical remote control. The selector dial is a spur gear which can be meshed with a remote control take-off. The bottom of the multiratio section is flat for direct base mounting.

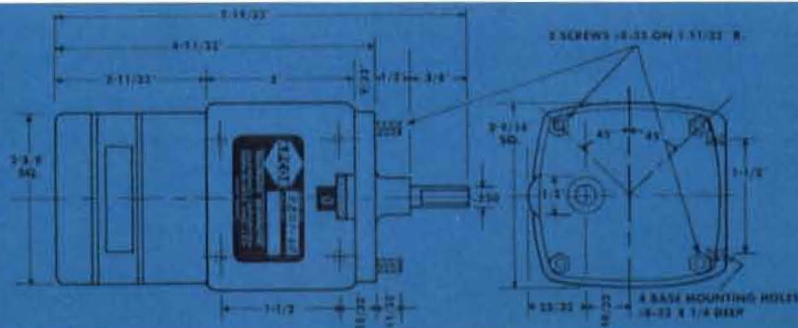
Extra detents provide a positive neutral position between each of the six ratios.

Dial Operated Multiratio Gearmotors are equipped with Bodine 115VAC synchronous motors, providing six exactly repeatable speeds from AC lines. Induction Motors can be supplied on request, but in any event the multiratio section is limited to 50 in. oz. maximum output torque. The standard synchronous motors are reversible.

All bearings are wick oiled.

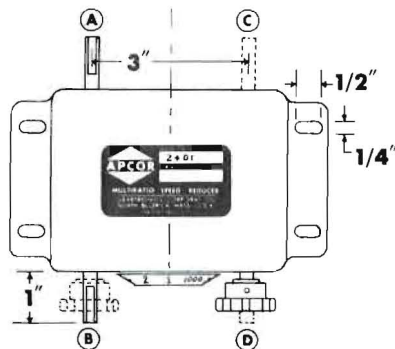
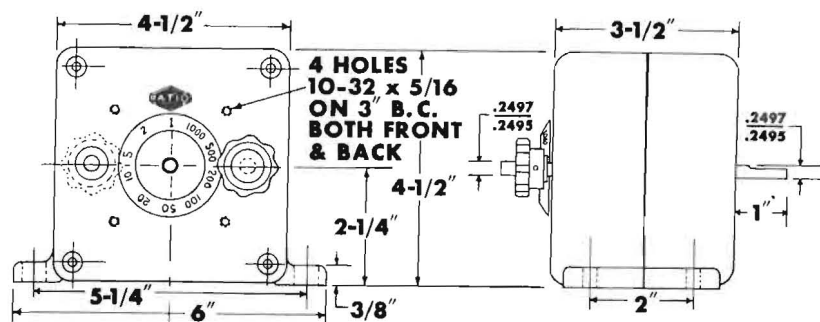
Although the multiratio section comes in an attractive shade of semi-gloss aqua blue, the motor and output end plate are black. If desired, however, special colors can be provided to meet the wishes of customers.

A special electrically operated reversing unit, which will eliminate all backlash, is available for attachment either directly to the APCOR Multiratio Gearmotor or to the driven shaft somewhere between the Gearmotor and its driven load.





# The Series 2400



## OPTIONS:

- (A) Standard Input, or Optional Output
- (B) Standard Output, or Optional Shift
- (C) Optional Input, or Optional Output
- (D) Standard Shift, or Optional Output

Options must be specified by letter location when ordering, because shafts cannot be relocated in the field. Unless otherwise specified, the standard in-line shaft model will be shipped.

# The Series 2200

APCOR Series 2200 Multiratio Gearmotors are available from stock in any one of 52 combinations, as shown in the four tables below. For example, Model 2203-15 has a motor speed of 15 RPM and a

PRICE \$150.00 EACH

ratio series of 1, 2, 5, 15, 30 and 60 to 1, resulting in output speeds of 15, 7 1/2, 3, 1, 1/2 and 1/4 RPM. Special combinations of ratio and output speed can be provided on request.

Table 1: MODEL 2201 —

Model 2201	Motor Speed (RPM)	Output Torque* (in. oz.) at 1-1 Ratio	Output Speeds (RPM) at Reduction Ratio:					
			1-1	2-1	5-1	10-1	20-1	50-1
-1	1	50	1	1/2	1/5	1/10	1/20	1/50
-1 1/2	1 1/2	50	1 1/2	3/4	3/10	3/20	3/40	3/100
-2	2	50	2	1	2/5	1/5	1/10	1/25
-3	3	50	3	1 1/2	3/5	3/10	3/20	3/50
-6	6	50	6	3	1 1/5	3/5	3/10	3/25
-10	10	32	10	5	2	1	1/2	1/5
-15	15	21	15	7 1/2	3	1 1/2	3/4	3/10
-25	25	12	25	12 1/2	5	2 1/2	1 1/4	1/2
-60	60	6.6	60	30	12	6	3	1 1/5
-100	100	4	100	50	20	10	5	2
-150	150	2.6	150	75	30	15	7 1/2	3
-200	200	2	200	100	40	20	10	4
-300	300	1.3	300	150	60	30	15	6

Table 2: MODEL 2202 —

Model 2202	Motor Speed (RPM)	Output Torque* (in. oz.) at 1-1 Ratio	Output Speeds (RPM) at Reduction Ratio:					
			1-1	2-1	4-1	8-1	16-1	32-1
-1	1	50	1	1/2	1/4	1/8	1/16	1/32
-1 1/2	1 1/2	50	1 1/2	3/4	3/8	3/16	3/32	3/64
-2	2	50	2	1	1/2	1/4	1/8	1/16
-3	3	50	3	1 1/2	3/4	3/8	3/16	3/32
-6	6	50	6	3	1 1/2	3/4	3/8	3/16
-10	10	32	10	5	2 1/2	1 1/4	5/8	5/16
-15	15	21	15	7 1/2	3 3/4	1 7/8	15/16	15/32
-25	25	12	25	12 1/2	6 1/4	3 1/8	19/16	25/32
-60	60	6.6	60	30	15	7 1/2	3 3/4	17/8
-100	100	4	100	50	25	12 1/2	6 1/4	3 1/8
-150	150	2.6	150	75	37 1/2	18 3/4	9 3/8	4 11/16
-200	200	2	200	100	50	25	12 1/2	6 1/4
-300	300	1.3	300	150	75	37 1/2	18 3/4	9 3/8

Table 3: MODEL 2203 —

Model 2203	Motor Speed (RPM)	Output Torque* (in. oz.) at 1-1 Ratio	Output Speeds (RPM) at Reduction Ratio:					
			1-1	2-1	5-1	15-1	30-1	60-1
-1	1	50	1	1/2	1/5	1/15	1/30	1/60
-1 1/2	1 1/2	50	1 1/2	3/4	3/10	1/10	1/20	1/40
-2	2	50	2	1	2/5	2/15	1/15	1/30
-3	3	50	3	1 1/2	3/5	1/5	1/10	1/20
-6	6	50	6	3	1 1/5	2/5	1/5	1/10
-10	10	32	10	5	2	2/3	1/3	1/6
-15	15	21	15	7 1/2	3	1	1/2	1/4
-25	25	12	25	12 1/2	5	1 2/3	5/6	5/12
-60	60	6.6	60	30	12	4	2	1
-100	100	4	100	50	20	6 2/3	3 1/3	1 2/3
-150	150	2.6	150	75	30	10	5	2 1/2
-200	200	2	200	100	40	13 1/3	6 2/3	3 1/3
-300	300	1.3	300	150	60	20	10	5

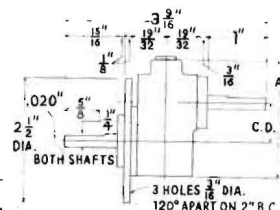
Table 4: MODEL 2204 —

Model 2204	Motor Speed (RPM)	Output Torque* (in. oz.) at 1-1 Ratio	Output Speeds (RPM) at Reduction Ratio:					
			1-1	2-1	5-1	10-1	15-1	30-1
-1	1	50	1	1/2	1/5	1/10	1/15	1/30
-1 1/2	1 1/2	50	1 1/2	3/4	3/10	3/20	1/10	1/20
-2	2	50	2	1	2/5	1/5	2/15	1/15
-3	3	50	3	1 1/2	3/5	3/10	1/5	1/10
-6	6	50	6	3	1 1/5	3/5	2/5	1/5
-10	10	32	10	5	2	1	2/3	1/3
-15	15	21	15	7 1/2	3	1 1/2	1	1/2
-25	25	12	25	12 1/2	5	2 1/2	1 2/3	5/6
-60	60	6.6	60	30	12	6	4	2
-100	100	4	100	50	20	10	6 2/3	3 1/3
-150	150	2.6	150	75	30	15	10	5
-200	200	2	200	100	40	20	13 1/3	6 2/3
-300	300	1.3	300	150	60	30	20	10

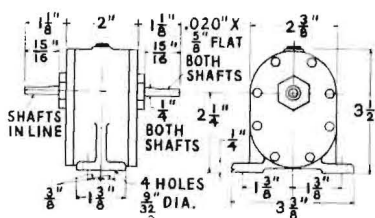
\* The recommended maximum output torque of the multiratio section is 50 inch ounces under continuous load. However, under intermittent or low speed load conditions the allowable torque may be safely increased. On these, and other high inertia and/or high impact load installations, we suggest you contact our engineering department.



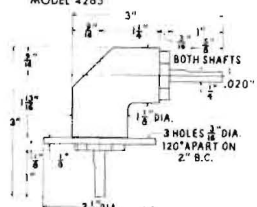
MODELS	DIM A	C.D
1242	24 $\frac{1}{2}$ "	305"
4245	33 $\frac{1}{2}$ "	1250"



**FIG. 2**  
SINGLE RATIO  
SPEED REDUCER,  
MODEL 4296

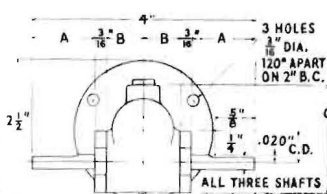


**FIG. 3**  
RIGHT ANGLE DRIVE  
MODEL 4265



**FIG. 4**  
RIGHT ANGLE SPEED REDUCER,  
SINGLE TAKE-OFF  
MODELS 4200, 4210 AND 4220

MODELS	DIM A	DIM B	DIM C	DIM D	DIM E	C.D.
4230	$2^{10}_{16}$	$1^{10}_{16}$	$7^{10}_{16}$	$1^5$	$11^7$	500°
4710	$2^{11}_{16}$	$1^{10}_{16}$	$3^{10}_{16}$	$1^{10}_{16}$	$1^{10}_{16}$	743°
4220	$2^{10}_{16}$	$1^{10}_{16}$	$3^{10}_{16}$	$1^{10}_{16}$	$2^{10}_{16}$	1078°

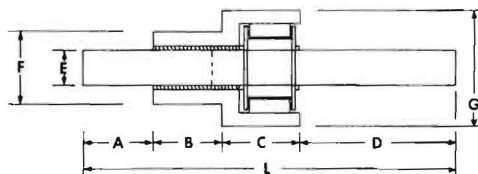


**FIG. 5**  
RIGHT ANGLE SPEED REDUCER,  
DUAL TAKE-OFF  
MODELS 4205, 4215 and 4225  
NOTE: See Fig. 4 for  
dimensions not shown

MODELS	DIM. A	DIM. B	DIM. C	C.D.
4205	1½"	1½"	1½"	500"
4213	1½"	1½"	2½"	743"
4225	1"	1½"	2½"	1,074"

is available with either a hardened and ground housing for heavy duty, or unhardened steel housing for general use.

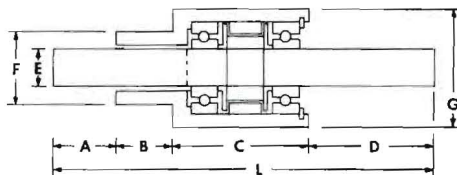
**MODEL SAH:**  
HOUSING HARDENED AND  
GROUND FOR  
HEAVY DUTY USE



APCOR CLUTCH — COMPLETE ASSEMBLY SLEEVE BEARING TYPES SA &amp; SAH

MODEL	A	B	C	D	E	F	G	L	TORQUE IN. LBS.	PRICE
<b>104-SA</b>	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$1\frac{1}{2}$	2497 2495	501 500	$1\frac{1}{2}$	$2\frac{1}{16}$	5	\$ 7.50
<b>105-SA</b>	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{1}{2}$	$1\frac{1}{2}$	3122 3120	626 625	$1\frac{1}{2}$	2 $\frac{1}{2}$	8	8.90
<b>106-SA</b>	$\frac{5}{8}$	$\frac{5}{8}$	$1\frac{1}{2}$	$1\frac{1}{2}$	3747 3745	6885 6875	$1\frac{1}{2}$	$3\frac{1}{8}$	13	11.20
<b>108-SA</b>	$\frac{5}{8}$	$\frac{5}{8}$	$1\frac{1}{2}$	$1\frac{1}{2}$	4997 4995	876 875	$1\frac{1}{2}$	4 $\frac{1}{2}$	31	16.30

**MODEL SBH:**  
 USING HARDENED AND  
 GROUND FOR  
 HEAVY DUTY USE



APCOR CLUTCH -- COMPLETE ASSEMBLY BALL BEARING TYPES SB & SBH

MODEL	A	B	C	D	E	F	G	L	TORQUE IN. LBS.	PRICE
<b>154-SB</b>	$\frac{7}{16}$	$\frac{3}{8}$	$1\frac{1}{16}$	$1\frac{1}{8}$	$\frac{2497}{2495}$	$\frac{501}{500}$	$1\frac{1}{16}$	$2\frac{1}{16}$	5	12.70
<b>156-SB</b>	$\frac{1}{2}$	$\frac{5}{8}$	$1\frac{1}{2}$	$1\frac{3}{8}$	$\frac{3747}{3745}$	$\frac{6885}{6875}$	$1\frac{1}{8}$	$3\frac{1}{16}$	13	17.00

Not available for 155S and 158S clutches

Note: When ordering any of the above assemblies with hardened and ground housings, add "H" to the model numbers shown in the tables above.

### MODELS - REDUCTION RATIOS - PART NUMBERS

STRAIGHT SPEED REDUCERS		
MODEL NO	REDUCTION RATIO	PART NO
4242 (Fig. 1)	1½:1	4242015
	2:1	4242002
4245 (Fig. 1)	3:1	4245003
	4:1	4245004
4296 (Fig. 2)	5:1	4296005
	10:1	4296010

## RIGHT ANGLE DRIVES

4255 (F 1)	1-1	4265001
	1 1/2-1	4265015
	2-1	4265002

Torque ratings on all models is 100 oz. in., except models 4265 and 4296 which are rated at 200 oz. in.

### RIGHT ANGLE SPEED REDUCERS (SINGLE TAKE-OFF)

MODEL NO.	REDUCTION RATIO	PART NO.	PRICE
4200 (Fig. 4)	1-1	4200001	\$16.80
	1½-1	42000215	16.80
	2-1	42000002	16.80
	3-1	42000003	16.80
	4-1	42000004	16.80
	5-1	42000005	16.80
4210 (Fig. 2)	10-1	42000010	16.80
	20-1	42100020	\$19.70
	30-1	42100030	19.70
	40-1	42100040	19.70
	50-1	42700050	\$23.50
4220 (Fig. 4)	60-1	42200060	23.50
	80-1	42200080	23.50
	100-1	42200100	23.50

### RIGHT ANGLE SPEED REDUCERS (DUAL TAKE-OFF)

MODEL NO	REDUCTION RATIO	PART NO.	PRICE
4205 (Fig. 5)	1-1	4205001	\$18
	2½-1	4205005	18
	2-1	4205002	18
	3-1	4205003	18
	4-1	4205004	18
	5-1	4205005	18
4215 (Fig. 5)	10-1	4205010	18
	20-1	4215070	\$21
	36-1	4215030	21
	40-1	4215040	21
	50-1	4275050	\$24
	60-1	4225060	24
4225 (Fig. 5)	80-1	4275080	24
	100-1	4225100	24

## COMPLETE ONE-DIRECTION CLUTCH ASSEMBLIES

### RIGHT OR LEFT HAND

All models are symmetrical. To change from a right hand drive to a left hand drive, simply remove the shaft-and-clutch assembly and re-insert opposite end in housing. Thus it is not necessary to stock both "right hand" and "left hand" models.

## CLUTCH COUPLINGS

These units may also be converted into clutch couplings by cutting the shaft off at the broken line (see drawings on next page) and securing the housing to your drive shaft.

## CUSTOM ASSEMBLIES

Special shaft lengths or components with shaft projections can be made to order, or Geartronics can design and/or manufacture special housings integral with an outer configuration in the form of a gear, cam, actuator arm or other component. We invite you to contact Geartronics for design suggestions and prices.

The new APCOR One-Direction Clutch has unique design principles which make it the most accurate, durable and trouble-free clutch of this type now available from stock. The APCOR One-Direction Clutch is precision built to close tolerances, insuring maximum load pickup accuracy and long life.

The APCOR One-Direction Clutch, when assembled between a shaft or shaft projection and a housing of specific inside diameter and optional external configuration, allows either shaft or housing to rotate free of the other in one direction and provides instant integration of the components in the opposite direction.

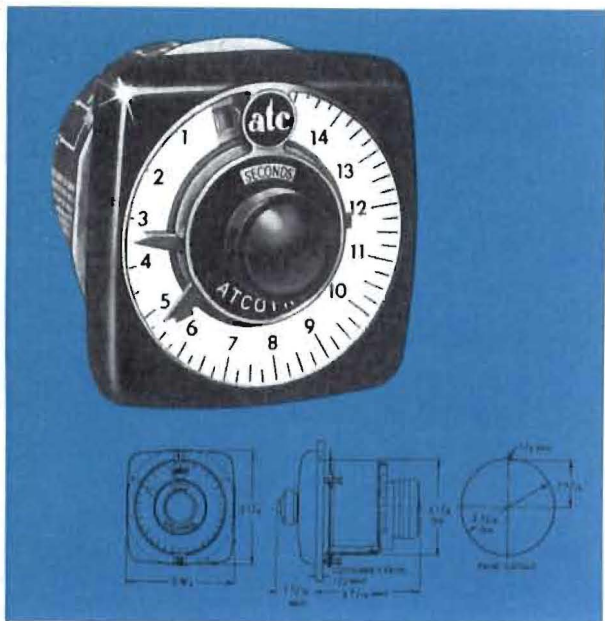
The APCOR One-Direction Clutch is an ideal component to accomplish:

- Intermittent motions where accuracy and repeatability of pickup is necessary.
- Motions requiring infinite indexing.
- Selectivity between dual or multiple drives.
- Safe overrunning of a load where the cessation of drive will be instant or braked.
- Free rotation of the driver in the counterdrive direction.



**SERIES 309**

**PUSH BUTTON AUTOMATIC RESET IMPULSE TIMER**



SERIES 309				
Dial Range	115 Volt, 60 Cycle		28, 48, 125 or 250 VDC	
	Single Switch	Two Switches	Single Switch	Two Switches
6 Sec.	\$28.00	\$29.50	\$ —	\$ —
15 Sec.	28.00	29.50	—	—
30 Sec.	27.00	28.50	69.50	71.00
60 Sec.	27.00	28.50	69.50	71.00
120 Sec.	27.00	28.50	69.50	71.00
240 Sec.	27.00	28.50	69.50	71.00
6 Min.	27.00	28.50	—	—
15 Min.	27.00	28.50	69.50	71.00
30 Min.	29.00	30.50	73.50	75.00
60 Min.	29.00	30.50	73.50	75.00
120 Min.	29.00	30.50	80.50	82.00
240 Min.	29.00	30.50	80.50	82.00
6 Hrs.	29.00	30.50	—	—
15 Hrs.	31.00	32.50	—	—
30 Hrs.	31.00	32.50	—	—
60 Hrs.	31.00	32.50	—	—

Push Button Automatic Reset Dial Timer will control up to 4 individual AC or DC circuits accurately while resetting automatically. And upon power failure or interruption, the Series 309 shuts off automatically and does not reset . . . therefore, when power is resumed, your timing cycle is resumed without worry — without loss of operation.

Ruggedly constructed, the Series 309 is a synchronous motor-driven unit, mountable at any angle with one-hole

cutout and modern ring clamp. The EXCLUSIVE ATCOTROL METAL-TO-NEOPRENE IMPINGEMENT CLUTCH permits millions of operations without wear or slippage and the one piece compression molded Terminal Block is specially designed for high dielectric strength.

Available in the popular panel mounting, front-of-panel mounting, surface mounting or plug-in mounting, the Series 309 is easy to operate and easy to install due to the wiring schematic printed on the cover and the special key slot arrangement which automatically positions the schematic.

Accurate up to 1/4 of one per cent repeat accuracy. Contacts rated at 10 amps for all AC units.

And, remember, you just push a button and walk away confidently with the assurance that the high quality comparatively low cost Series 309 Push Button Timer will accurately perform a great multitude of automatic functions with automatic reset.

\*Please specify: Voltage, Frequency, Single or Double Switch, Dial Range and Mounting.

ATC Timers and Counters are used to automatically control components such as motors, valves, solenoids, heating elements, lamps, and relays. Timers are used for controlling the time at which some action starts or stops, or the length of time components or devices are "on" or "off."

Counters are used to control the number of pieces packaged, length of stock, revolutions of shaft, etc.

Impulse Counters are used to control the number of pieces in a package, the number of times an action takes place or a device is operated.

Revolution Counters are used to control the total number of revolutions of a shaft or spindle, the length of stock, wire, ribbon or tape, etc.

FOR FREE 20 PAGE REPRINT FROM MACHINE DESIGN ON HOW TO SELECT AND APPLY TIMERS, PLEASE WRITE TO US.

**ADJUSTABLE DIAL TIMERS**

304—Usually controls electric heating elements by turning current on and off periodically as set on dial.

34

305—Remote start, automatically resets to beginning of cycle when required. 1/4% accuracy, moderate cost.

306—Double dial type for controlling two loads, or "on" and "off" times respectively.

308—Solid state electronic. For short timing operations (down to .03 sec.) extremely long life.

309—Local start, with built-in start button. Automatically resets to beginning at end of cycle. 1/4% accuracy, low cost.

320/321—Remote and/or local start. Automatic reset. 2% accuracy. Low cost.

5200—Electronic tube-type. For short timing operations (down to .02 sec.) extensive life.

**CAM TIMER**

2300—Sequence operation of up to 12 load circuits. Non-reset. Also available without timing motor for direct coupling to machine. Screw adjustable cams.

**TIME INDICATORS**

5700—Shows total running time in hours, minutes or seconds. Non-reset.

5701—Same as 5700, but manual reset to zero.

**IMPULSE COUNTERS**

310—Same as 305 but operated by pulse signals rather than time.

311—Same as 309 but operated by pulse signals rather than time.

**REVOLUTION COUNTERS**

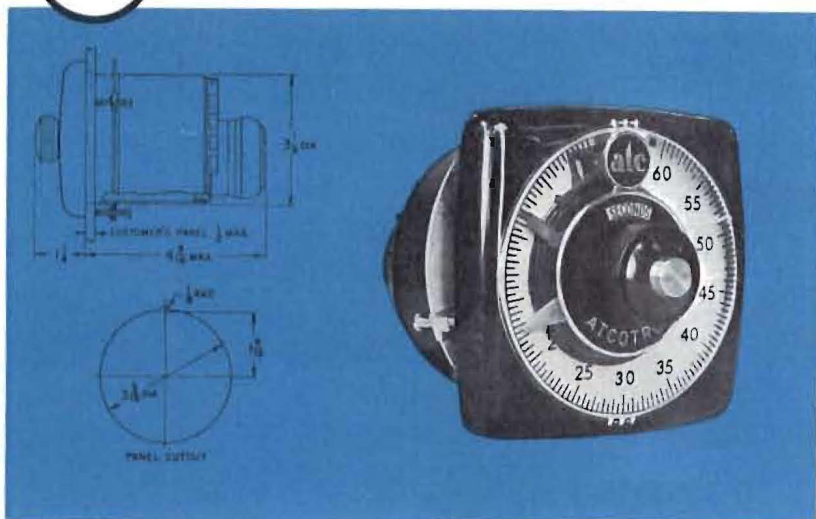
307—Same as 305 except operated by direct coupling to rotating member of machine (shaft) rather than time.

312—Same as 309 except operated by direct coupling to rotating member of machine (shaft) rather than time.





SERIES 305B  
AUTOMATIC RESET DIAL TIMER



	305B						
	115V		230V		DC Models 28, 48, 125 250V D.C.	Minimum Setting	Gradua- tions
	60cy.	50cy.	60cy.	50cy.			
6 Sec.	\$44.00	\$45.50	\$45.00	\$46.50	\$ -	3/10 Sec.	60
15 Sec.	44.00	45.50	45.00	46.50	-	1/4 Sec.	60
30 Sec.	43.00	44.50	44.00	45.50	86.50	1/2 Sec.	60
60 Sec.	43.00	44.50	44.00	45.50	86.50	1 Sec.	120
120 Sec.	43.00	44.50	44.00	45.00	86.50	2 Sec.	120
240 Sec.	43.00	44.50	44.00	45.50	86.50	4 Sec.	120
6 Min.	43.00	44.50	44.00	45.00	-	6 Sec.	60
15 Min.	43.00	44.50	44.00	45.50	86.50	15 Sec.	60
30 Min.	45.00	46.50	46.00	47.50	90.50	30 Sec.	60
60 Min.	45.00	46.50	46.00	47.50	90.50	60 Sec.	120
120 Min.	45.00	46.50	46.00	47.50	97.50	120 Sec.	120
240 Min.	45.00	46.50	46.00	47.50	97.50	240 Sec.	120
6 Hrs.	45.00	46.50	46.00	47.50	-	1/10 Hr.	60
15 Hrs.	46.00	48.00	47.00	49.00	-	1/4 Hr.	60
30 Hrs.	46.00	48.00	47.00	49.00	-	1/2 Hr.	60
60 Hrs.	46.00	48.00	47.00	49.00	-	1 Hr.	120

\* Plug-In units up to 6 hrs., add 1.00

\*\* Plug-In units for 15 hrs., 30 hrs., and 60 hrs., 50 Cycle & 25 Cycle, and over 28V. DC on application.

Undoubtedly the most popular general purpose Timer, the Series 305B, is used thruout industry to control AC or DC functions within variable timed intervals or sequences. Repeat accuracy of AC units is 1/4 of one per cent. It will reset automatically over the full scale length in less than 1/4 of a second . . . and will stop or reset (either option at no additional cost) automatically and immediately upon power failure or interruption. The Series 305B is your answer to versatile and reliable control of AC or DC circuits.

Conveniently printed on the cover of the #305B, is a wiring schematic and the special key slot arrangement automatically positions tubing and schematic to correct location. The 14-point Terminal Block and the six easily connected basic circuit arrangements provide infinite combinations for the reliable control of automatic operations.

Millions of operations without Clutch wear or slippage is achieved because of the EXCLUSIVE metal to neoprene impingement Clutch . . . and the self-cleaning heavy duty silver contacts are rated: 10 amps at 115 VAC, 5 amps at 230 VAC, and 1/4 amp at 115 VDC. The rugged precision engineered construction of this Timer as well as its up-to-the minute appearance has made it the standard in all types of industrial and development facilities.

The Series 305B is truly your answer to LOW COST - RELIABLE Timer Control of AC or DC functions.

STANDARD ENCLOSURES

No. 192-D Case NEMA type 1 for flush or surface mounting; sheet steel construction; black wrinkle enamel finish; external timer adjustment.

6 3/4" H x 5-11 16" W x 6-11 16" D

Panel cut-out size:

6" H x 4-15 16" W \$10.50

No. 220-C & 220-F NEMA type; Class 1 Group D, Div. 1 Explosion Proof with cast aluminum construction, natural finish; external adjustment for panel or heavy conduit mounting.

220-C for all A.C. timers and D.C. timers 28 volts and under,

114.00

220-F for all D.C. timers over 28 volts,

126.00

No. 201-A-1-XX Case NEMA type 1A with hinged cover; sheet steel construction; black wrinkle finish; external adjustment; for universal mounting.

9 1/4" H x 6 1/4" W x 6 1/2" D

Panel cut-out size: 9 1/4" H x 5 1/4" W

FIVE STANDARD MOUNTINGS  
TO FIT YOUR EVERY NEED



ONE HOLE  
PANEL MOUNTING



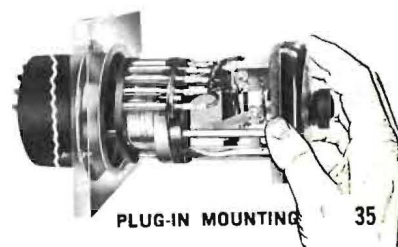
SURFACE  
MOUNTING



BEZEL  
MOUNTING



FRONT-OF-PANEL  
MOUNTING

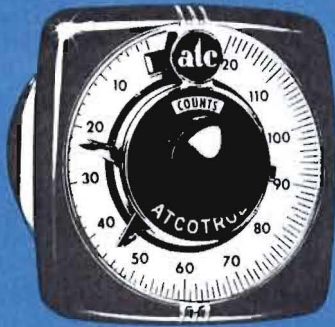


PLUG-IN MOUNTING



## AUTOMATIC RESET IMPULSE COUNTER

SERIES 310



## PUSH BUTTON AUTOMATIC RESET

SERIES 311



Push Button Control



**CONTROLS MACHINE AND PROCESS  
OPERATIONS FROM ELECTRICAL  
IMPULSE SIGNALS — RESETS AUTOMATICALLY**

Requiring only a minimum of 50 milliseconds pulse duration, the Series 310 Automatic Reset Impulse Counter, will reliably record, from pulse switch signals, the number of pieces produced or the amount of material in flow. Upon completion of the pre-determined cycle, the Series #310 will automatically reset full scale length in less than 1/5 th of a second with minimum pointer rebound.

Individual wiring of all connections is accomplished with the EXCLUSIVE 14-point Terminal Block and numerous circuit arrangements are available for the control of AC or DC circuits, either working dependently or independently from the Counter's control circuit. This gives you tremendous flexibility to automatically and reliably control a great variety of functions through use of this accurate and low cost Impulse Counter.

Contact ratings: 10 amps at 115 VAC, and 1/4 amp at 125 VDC. Enclosures for Series 310, see page 35

DIAL RANGE — REPEAT ACCURACY — PRICE LIST		
Dial Range	Plus or Minus Repeat Accuracy	115 VAC — 60 Cycles
1 to 40	0	59.50
2 to 120	0	59.50
4 to 240	1	63.50
10 to 480	2	63.50
20 to 960	2	63.50

\* For 230 VAC, 60 Cycle add 1.00  
\*\* For Plug-In units, add 3.50

Please specify: Voltage, Frequency, Dial Range and Mounting. Also, automatic reset or stop upon power failure.

**CONTROLS MACHINE AND PROCESS  
OPERATIONS FROM ELECTRICAL  
IMPULSE SIGNALS — RESETS AUTOMATICALLY**

Performing basically the same operations as the 310 Impulse Counter (to the left), the Series 311 engages automatically by means of a push-button device on the front of the Counter. It does not offer the feature to operate remotely as does the 310.

Available with either 1 or 2 SPDT snap-action 10 amp load Contacts, the Series 311 resets automatically in .2 seconds and has a very high repeat accuracy as shown below.

Precision engineered to perform millions of trouble free operations, the Series 311 and Series 310 is used as a "standard" throughout industry and in development facilities for accurate and reliable impulse counting for automatic functions. Enclosures for Series 311, see page 35

DIAL RANGE — REPEAT ACCURACY — PRICE LIST		
Dial Range	Plus or Minus Repeat Accuracy	115 VAC — 50/60 Cycles
1 to 40	0	45.00
2 to 120	0	45.00
4 to 240	1	49.00
10 to 480	2	49.00
20 to 960	2	49.00

\* For 2 SPDT Switches add, 1.50  
\*\* For 230 VAC 50/60 Cycles, 1.00  
\*\*\* Plug-In units, 3.50 additional.

Please specify: Voltage, Frequency, Dial Range and Mounting.



REPEAT CYCLE TIMER  
SERIES 306

TWO TIMERS IN ONE



PROVIDING ON-OFF OR ALTERNATE CYCLING  
FOR INDUSTRIAL MACHINES  
AND PROCESSES — TWO TIMERS IN ONE

Called the "Duo-Set" Timer, the Series 306 is really two Timers in one because it alternately controls two pairs of independent circuits and eliminates the need for two Timers. The dial is divided between right and left and both sides are independently pre-set by means of two knobs on the face of the Series 306 Repeat Cycle Dial Timer.

Providing up to a 4% dwell period for safe drive reversing, the Series 306 eliminates the need for springs, solenoids, ratchets, pawls or delicate and complicated mechanical assemblies. Designed to quickly and safely accomplish on-off cycling and other automatic functions, the Series 306 has built in safety over-ride feature to allow immediate transfer of load circuits in cases of emergency. The Timing cycle is automatically stopped in cases of power failure or interruption.

Formerly available only in high priced "custom made" Timers, the Series 306 fills industry and laboratory's requirements for reliable, trouble free and accurate Repeat Cycle Timing. Enclosures for the Series 306 Timer appears on this catalog.

PRICE LIST & DIAL INFORMATION ALL DIALS GRADUATED WITH 120 DIVISIONS				
Dial Range	Minimum Setting	Value of Graduations	Max. Dwell Attainable for Load Reversal*	Price
30 Sec.	1 Sec.	1/2 Sec.	1.2 Sec.	\$62.00
60 Sec.	2 Sec.	1 Sec.	2.4 Sec.	
120 Sec.	4 Sec.	2 Sec.	4.8 Sec.	
240 Sec.	8 Sec.	4 Sec.	10 Sec.	
15 Min.	30 Sec.	1/4 Min.	36 Sec.	\$63.00
30 Min.	1 Min.	1/2 Min.	72 Sec.	
60 Min.	2 Min.	1 Min.	2.3 Min.	
120 Min.	4 Min.	2 Min.	4.6 Min.	
240 Min.	8 Min.	4 Min.	9.4 Min.	

\* Dwell period can be factory-set if specified at time of ordering (Minimum 1% of dial range).  
\*\* For 230 VAC 60 Cycles, add 1.00  
\*\*\* Other Frequencies, such as 25 Cycles and 50 Cycles on application.

Please specify: Dial Range, Frequency, Voltage and Mounting. Also, dwell range

TIME DELAY / INTERVAL TIMER  
SERIES 320



AUTOMATICALLY SWITCHES ELECTRICAL CIRCUITS  
ON OR OFF EITHER AFTER A PRE-SET TIME  
OR DURING THE TIME PERIOD

Conservatively rated to have a mechanical life of over 3,000,000 cycles, the Series 320, is a brand new addition to the line. It is recommended to control any circuit where accuracy requirements are within 2% of dial range

Economical and rugged the Series 320 has a 10 point Terminal Block with Universal Connectors to not only give you great flexibility but to save you on installation costs.

The Series 320 will reset automatically the full scale in less than .05 sec. The picture above is the Series 320 which is also available unenclosed and is designated the Series 321.

DIALS		
60 Cycle Frequency Rating		
Ranges	Graduations	PRICE
5 Sec.	18	\$29.50
10 Sec.	18	\$29.50
20 Sec.	18	\$29.50
40 Sec.	18	\$29.50
60 Sec.	27	\$29.50
150 Sec.	27	\$29.50
5 Min.	18	\$29.50
10 Min.	18	\$29.50
20 Min.	18	\$29.50
40 Min.	18	\$29.50
60 Min.	27	\$29.50
150 Min.	27	\$32.50
5 Hrs.	18	\$32.50
10 Hrs.	18	\$32.50

Please specify: Voltage, Frequency, Dial Range.



## MANUAL SET PERCENTAGE TIMER SERIES 304

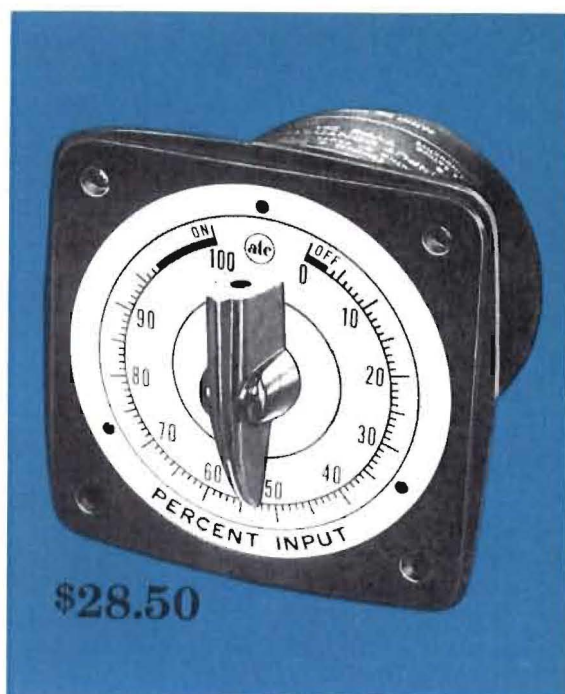
**INTERRUPTS POWER INPUT  
ON UNIQUE TIME-BASE PRINCIPLE**

*Simple — Cost Saving — Accurate*

Used on all types of electrically heated equipment, the Series 304 eliminates the need for expensive Rheostats and eliminates power waste while providing efficient stepless KWH Control. The Series 304 operates on continuous drive principle using a synchronous motor.

It controls temperature by interrupting heating circuits at regular intervals and the adjustable dial is calibrated 0 — 100%. For example, with a 60 second basic cycle, when pointer is set at 50%, power is fed to heating elements for 30 seconds then power automatically shuts off for 30 seconds. This on-off cycle is constantly repeating for straight line heating performance. The heavy duty load Contacts are rated: 25 amps at 115 VAC or 20 amps at 230 VAC non-inductive.

The price of \$28.50 is for the 60 second cam cycle. However, at no additional charge 30 second and 15 second can be furnished. For 230 VAC 50/60 Cycles, add 1.00 additional. Other Voltages and Frequencies on application.



## ELAPSED TIME INDICATORS

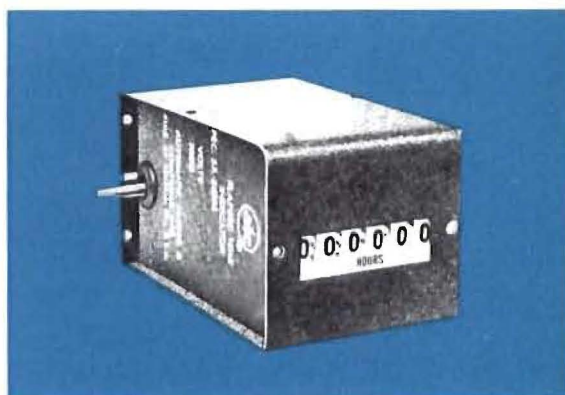
### SERIES 5700

VOLTAGE FREQUENCY				RANGE
24/60	115/60	230/60	230/50	0-99,999.9 Minutes
\$11.00	\$11.00	\$11.50	\$12.00	0-99,999.9 Hours

### SERIES 5701

115/60	230/60
\$18.00 Minutes	\$18.50 Minutes
\$18.00 Hours	\$18.50 Hours
\$18.50 Seconds	\$19.00 Seconds

The model 5701 can be reset at any time



Saves many maintenance dollars and provides a tamper-proof check on production equipment. Truly the answer to thousands of daily problems confronting industrial engineers, research engineers, maintenance men, production and test personnel. Runs only when its motor runs and CAN NOT BE RESET BY UNAUTHORIZED PERSONNEL. Mounted from any angle, the Series 5700 measures: 3-7/8" L. x 2-7/16" W. x 2-13/64" H. Available for 24, 115 or 230 Volt operation.

**IMMEDIATE DELIVERY FOR ALL MODELS**





REVOLUTION COUNTER  
SERIES 307

OPENS OR CLOSES A CIRCUIT AFTER COMPLETING  
DIAL SET NUMBER OF SHAFT REVOLUTIONS —  
RESETS AUTOMATICALLY

Series 312 similar to Series 307 except that it includes a start button  
integral with the front count setting knob.

The Series 307 requires only 1¼" oz. torque to perform the opening or closing of a circuit after completing a pre-set number of shaft revolutions. The 307, which Controls on either AC or DC, will function at speeds up to 2,000 RPM. It has a great many uses, but it is primarily used for controlling machines which are subject to variations in processing speeds and for extending operation life by the elimination of direct pulse counting devices.

Modern in appearance, the Counter requires a minimum of panel space and is capable of performing over 100 different electrical control arrangements. Simplicity and versatility.

DIAL RANGE 0-12 — 0-6,000 \$66.00		DIAL RANGE 0-15,000 — 0-240,000 \$71.00	
0-12	0-300 C-CW	0-15,000	0-60,000 C-CW
0-24	0-600 C-CW	0-24,000	0-120,000 C-CW
0-60	0-1200	0-30,000	0-240,000 C-CW
0-120	0-2400		
0-150 C-CW	0-3000		
0-240 C-CW	0-6000		

WHEN ORDERING...

Please specify: Voltage, Frequency, Dial Range and Mounting.  
Also, Automatic Reset or Stop upon power failure.

STOP CYCLE DIAL TIMER  
SERIES 2800

Automatically opens and closes electrical Contacts for the control of machinery and process functions at a timing accuracy within .5 per cent, the Series 2800 HEAVY DUTY Automatic Reset Timers are the "busiest Timers in all industry." Types 2800 and 2811 are "Vernier-Set" Timers and Types 2865 and 2871 are "Cycle-Progress" Timers. When power supply is interrupted, Types 2805 and 2865 Timers are automatically and instantaneously reset to zero. Types 2811 and 2871 Timers, upon power interruption, will remain in position and continue the timing cycle when power is resumed. Heavy duty SPDT silver contacts are rated 25 amps at 115 VAC and 15 amps at 230 VAC.



PRICE UNENCLOSED 115 V. 60 CY.				
Dial Range	2805	2811	2865	2871
Seconds				
**15, 30, 60	\$75.00	\$75.00	N. A.	N. A.
120 Seconds	\$71.00	\$71.00	\$ 71.00	\$ 71.00
240 Seconds	\$63.00	\$63.00	\$ 71.00	\$ 71.00
Minutes				
10, 15	\$63.00	\$63.00	\$ 71.00	\$ 71.00
30, 60, 120, 240	\$75.00	\$75.00	\$ 78.00	\$ 78.00
Hours				
10, 15, 30 Hours	\$75.00	\$75.00	\$ 78.00	\$ 78.00
60	\$92.00	\$92.00	\$ 92.00	\$ 92.00
120	\$92.00	\$92.00	\$112.00	\$112.00

\* For 230 VAC 60 Cycles, add 1.00  
\*\* Other Voltages and Frequencies on application.

WHEN ORDERING...

Please specify: Voltage, Frequency, and Dial Range.

PRINTED CIRCUIT  
ELECTRONIC TIMERS

FOR ACCURATE SHORT  
INTERVAL TIME CONTROL

Providing high repeat accuracy for short interval time control of machine and process operations, the Series 5200 is unaffected by line voltage fluctuations, tube aging or vibration. Printed circuit design and few mechanical parts make for long service life at fast repetitive cycling. Available in single or dual timing ranges, the dial of the Series 5200, may be mounted remotely. Two SPDT control Contacts are rated: 15 amps at 115 VAC and 7½ amps at 230 VAC.



DIAL RANGE & PRICE LIST	
Single Range	
.02 to 1 Sec.	74.00
.2 to 10 Sec.	74.00
.4 to 20 Sec.	74.00
.5 to 30 Sec.	79.00
1 to 60 Sec.	83.00
2 to 120 Sec.	91.00
Dual Range	
.02 to 1 Sec. & .2 to 10 Sec.	83.00
.04 to 2 Sec. & .4 to 20 Sec.	83.00
.05 to 3 Sec. & .5 to 30 Sec.	88.00

\* For 2 SPDT Switches, add 2.00  
\*\* Other Voltages and Frequencies on application.  
\*\*\*For 230 Volt 50 or 60 cycle operation add \$2.00

WHEN ORDERING...

Please specify: Voltage, Frequency, and Dial Range.



# GENERAL INFORMATION ON ELECTRIC BRAKES AND CLUTCHES

Simplatrol's unique design offers such outstanding advantages as:

quiet smooth operation—ease of installation—rated torque at installation—positive armature release—less maintenance and wear, and zero backlash

Static torque ratings from 10 oz.-ins. to 470# ft. in diameters from less than 1" to 12¼" are available.

Right from our stock you can get super-swift service on the full line of Simplatrol Electric Clutches and Brakes . . . for automatic or automated control of new equipment or as part of your upgrading program . . . there is a Simplatrol Electric Clutch & Brake performance-rated for the job.

Simplatrol's exclusive one-piece armature eliminates springs, pins, splines, sliding plates, sliding friction, backlash, and the usual "bag full of parts to assemble". Merely slide the shaft through the unit and mount it. Since there are no sliding metal parts, these clutches and brakes provide shock-free, smooth and quiet operation. They will not "stick" or "hang up" after electrical power is removed.

Simplatrol clutches and brakes are **EASIER TO INSTALL** than other units as they consist of only two or three parts which are simply slid together on a shaft. Necessary running clearances are automatically established on almost all types. All clutches have bearings and provisions (tapped holes and machined hubs) for easily mounting a drive pulley, gear or sprocket. Brake sizes 20 through 80 have bearings; sizes 100, 130 and 160 are available with bearings if specified.

## ELECTRIC CLUTCHES CAN .

Introduce **REMOTE CONTROL** into a machine operation by making use of a wide variety of sensing devices which provide an electrical signal to actuate the clutch.

Provide **SMOOTH STARTS** to prevent machine damage, product damage, product spillage or product disarray.

**PREVENT MOTOR BURN-OUTS** or **MACHINE DAMAGE** by simply setting the clutch to slip under abnormal load conditions.

**RAPIDLY SELECT DIFFERENT SPEEDS** (duplex clutch) using one motor.

**RAPIDLY REVERSE A SHAFT** (duplex clutch) without reversing the motor.

**INCREASE MACHINE SPEED** since the motor can run continuously thus eliminating time required to stop and start it. Machine duty cycles (number of operations per minute) can be greatly increased.

**REDUCE WEAR** on gears, belts, sprockets and chains by minimizing the number of times they must be started and stopped.

### Size 20 — 80

### REACTION TIMES

Size of Unit

	20	30	40	50	60	61	80
EXITATION							
RATED COIL VOLTAGE SUPPLY	9	12	16	21	25	30	55
HIGHER THAN RATED SUPPLY, DROPPED TO RATED ACROSS COIL BY RESISTOR	4	5	8	11	15	18	25
INITIAL OVERVOLTAGE FROM CAPACITOR	2	3	4	4	5	6	9

Reaction times shown are the elapsed times required between switch closure and intimate contact of torque producing faces. All values are average of times of standard units recorded by an oscilloscope; deviations above and below can be expected.

## HOW TO CHOOSE THE SIZE...

SIMPLATROL makes 13 sizes with torque ratings from 10 ounce-inches to 470 pounds-foot.

APPLICATION	SIZES
Instrument and sub-fractional H.P.	20, 30, 40 & 50
Fractional H.P.	60, 61, 80 & 100
1 to 40 H.P.	130, 160, 210, 260, 310

Note: Actual selection of size should be made on the basis of torque required.

## TECHNICAL DATA

SIZE	RATED STATIC TORQUE LB.-IN.	COIL POWER WATTS	BORE INCHES	OUTSIDE DIA. INCHES	MAX. OVERALL LENGTH — INCHES						
					B, C	K	CB, D	FFC, FFK	FFKB	FFCB	FFD
20	.625	2	5/32	7/8	1 13/32	1 75/64	2 7/32	1 33/64	2 11/32		
30	1.875	2.5	3/16	1 1/16	1 53/64	1 3/4	2 27/32	1 13/16	2 5/16		
40	7.2	4	1/4	1 17/64	2 3/32	1 59/64	3 39/64	2 13/64	3 1/16	3 29/64	3 29/64
50	16	5	5/16	2	2 17/32	2 1/4	4 11/64	2 41/64	4 8/32		
60	50*	13	1/2	2 3/16	2 59/64	2 57/64	4 21/32	3 5/64	4 27/32	4 25/32	4 29/32
61	75	20	1/2	2 3/16	2 31/32	2 61/64	4 5/64				
80	100	15	5/8	3 1/8	3 3/32	3 23/64	5 5/16	3 33/64	5 35/64		

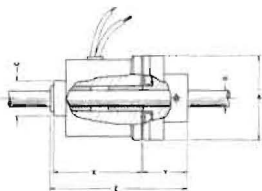


BRAKES

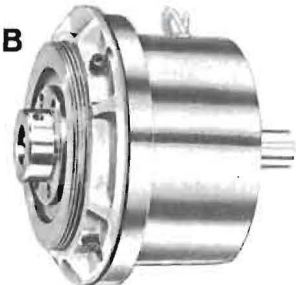
B



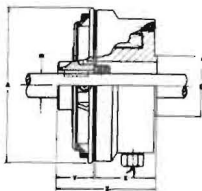
B



B



B20-B80



B

SHAFT NOT FURNISHED

B100, 130, 160

BRAKES B-20, B-30, B-40, B-50, B-60, B-61, B-80, B-100, B-130, B-160

Size	Rated Static Torque	Diam. A	Bore	Lgth inches	Coil Power Watts	PRICE EACH
20	10 oz. in.	7/8	.1575	1-13/32	2	31.50
30	30 oz. in.	1-3/16	.1885	1-53/64	2	32.00
40	115 oz. in.	1-9/16	.251	2-3/32	4	32.50
50	16 lb. in.	1-31/32	.3135	2-7/32	5	41.00
60	50 lb. in.	2-19/32	.5015	2-29/32	12	52.50
61	75 lb. in.	2-19/32	.5015	2-31/32	18	57.50
80	100 lb. in.	3-1/8	.626	3-9/32	14	62.50
100	20 lb. ft.	4	.626	3-37/64	20	84.50
130	40 lb. ft.	5-1/4	.7515	4-19/64	26	97.50
160	60 lb. ft.	6-7/16	1.001	4-3/64	27	119.00

Prices for all voltages 6, 12, 24 and 90 are the same.

If ball bearings are desired in brake, add to prices as follows:  
Sizes 100-9.50, 130-9.75, 160-10.50

Shafts shown are for illustrative purposes only and are not supplied.  
Standard voltage for all items on page is 90VDC. except sizes 20 and 30. 6, 12, 24 VDC. available also.

" FAIL-SAFE " SPRING APPLIED BRAKES

BRAKES SAB-40, SAB-50, SAB-61, SAB-100

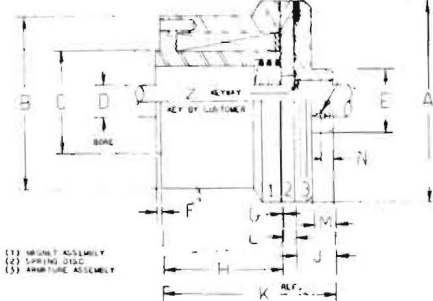
Simplatrol Spring Applied Brakes consist of three assemblies: a magnet which is secured to a stationery member, a spring plate which moves axially on pins located in the magnet, and an armature plate with friction material on one side secured to customer's shaft.

When the coil is de-energized, the spring located in the magnet is free

to exert a force against the spring plate, causing the plate to move axially against the friction facing of the armature which produces stopping or holding torque. Lesser torque values may be attained for a specific unit by changing spring force.



SAB



(1) MAGNET ASSEMBLY  
(2) SPRING PLATE  
(3) ARMATURE ASSEMBLY

UNIT NO.	STATIC TORQUE RATING	COIL POWER WATTS	PRICE EA.
SAB-40	50 Oz. In.	4	42.50
SAB-50	100 Oz.-In.	5	51.00
SAB-61	32 Lb.-In.	18	67.50
SAB-100	152 Lb.-In.	20	94.00

DIAMETERS (INCHES)						LENGTH (INCHES)							
UNIT SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N
SAB-40	1 1/16	1 7/16	.500 .495	.250 .251	7/8	3/32	.006 .008	1 1/32	1 9/32	2 1/32	1/8	3/8	5/32
SAB-50	1 3/32	1 3/4	.625 .620	.3125 .3135	5/8	7/32	.008 .012	1 17/32	1 9/32	2 21/64	3/16	3/8	5/32
SAB-61	2 13/32	2 1/4	1.000 .995	.5005 .5015	7/8	1/8	.008 .012	1 13/16	2 5/32	2 27/32	1/4	7/16	7/32
SAB-100	3 15/16	3 3/8	2.000 1.998	.626 .625	1 1/4	3/32	.008 .012	2 9/32	3/4	3 19/32	1/4	1 3/32	1/4

BORES SHOWN ARE STANDARD. BORE RANGE MAY GO TO MAXIMUMS AS SHOWN IN TABLE

UNIT	MAX. BORE RANGE
SAB-40	3/8
SAB-50	1/2
SAB-61	5/8
SAB-100	1-3/8



## BRAKE (B)

Magnet body B is mounted securely to frame. Armature is fastened to shaft and rotates with shaft. When voltage is applied to B, the armature A is attracted to B and the braking action occurs. Remove power from motor or de-clutch motor from shaft when brake is energized.

### TYPICAL APPLICATION – STOPPING

A load can be stopped rapidly either as a normal function or in the event of an inadvertent failure of any number of machine operations such as failure to feed, jamming, material breakage, spillage, etc.

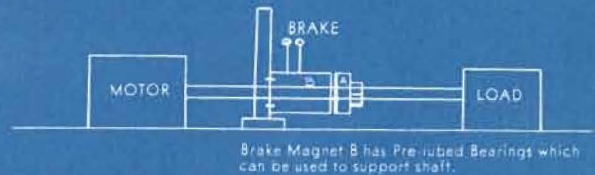


Figure 1

## CLUTCH (C or FFC)

Clutch magnet C has internal bearings and rotates on the shaft before voltage is applied. Armature A is fastened to the shaft. When a voltage is applied to C, the armature A is attracted to C and the driving action is transmitted to the shaft and load.

### TYPICAL APPLICATION – CONNECTING LOADS TO MOTORS

A load can be connected (or disconnected) to (or from) an a-c or d-c motor without stopping the motor. Overall machine operation can be improved by increasing the machine speed (time to start and stop motor is eliminated). Remote control is easily attained. Starting and stopping gears and pulleys and chains and sprockets can be eliminated by placing the clutch at the proper place.

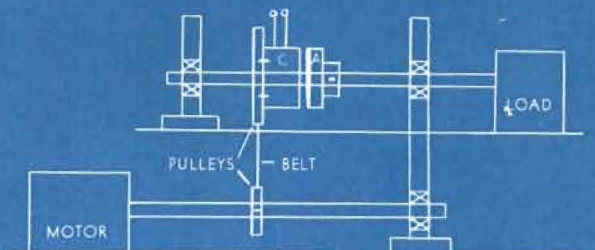


Figure 2

## CLUTCH (C or FFC)

Clutch operates the same as shown in figure 2. In figure 3 it is placed between a reducer and the load and its voltage is variable.

### TYPICAL APPLICATION – PROTECTION AGAINST MOTOR BURN-OUT AND MACHINE BREAKAGE

The output torque of an electric clutch varies with applied voltage. By setting the voltage so that the clutch will slip under adverse operating conditions (such as jamming), the machine and its drive components can be relieved of damage. Use a control with a variable output voltage.

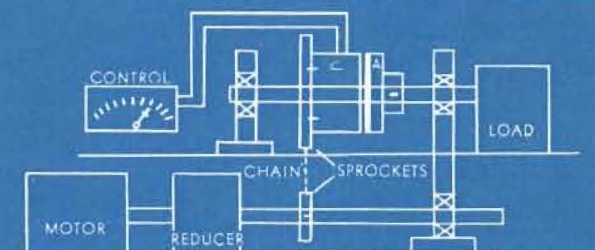


Figure 3

## COUPLING (K or FFK)

A coupling operates like a clutch except it is used to connect two in-line shafts together. Shaft centers must be aligned for proper operation.

### TYPICAL APPLICATION – CONNECTING A MOTOR AND LOAD IN LINE

Figure 4 illustrates the basic use of the coupling. This arrangement could also be used as a protective device as described in the text for figure 3.

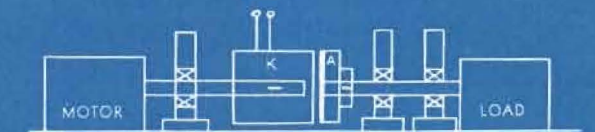


Figure 4

## COUPLING – BRAKE (FFKB)

This unit combines the features of a coupling and a brake in a single package. Shaft centers must be aligned for proper operation.

### TYPICAL APPLICATION

This combination unit could be used to start and stop a conveyor or a lead screw and nut or a feed auger or a cotton pusher or an indexing table or a drill or a pair of feed rolls.

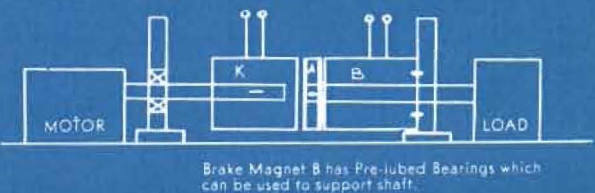


Figure 5



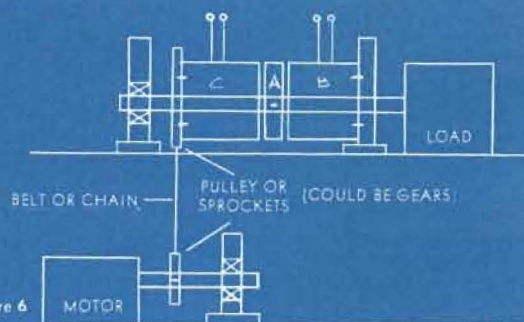


Figure 6

### CLUTCH-BRAKE (CB or FFCB)

This unit combines the features of a clutch and brake in a single package. It operates like a coupling-brake except it is mounted on a single, through shaft which is usually parallel to the motor shaft. Use in preference to the coupling-brake where possible.

#### TYPICAL APPLICATION - INDEXING, WINDING

This combination unit could index paper or metal strip or labels or bottles or cartons or film. It could be used for winding pre-determined lengths of string or wire or thread or plastic or any continuously wound material by setting a timer or counting shaft revolutions and energizing either the clutch or brake with the output from the timer or counter.

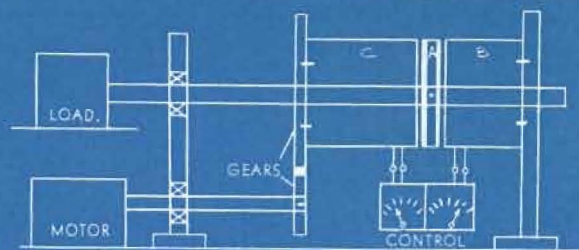


Figure 7

### CLUTCH-BRAKE (CB or FFCB)

The clutch-brake operates like the unit shown in figure 6. In figure 7, smooth starts and stops are possible by using a control with two variable output voltages. Stopping smoothness and starting smoothness can be independently set.

#### TYPICAL APPLICATION

Smooth stopping and smooth starting is possible for liquids in open containers, for machines that might be damaged if slammed on or off, for containers that must not be displaced when a conveyor starts or stops, for agitators, for thin webs of material that might rip, for minimizing food breakage during packaging or starting and stopping a wire brush on a flexible cable.

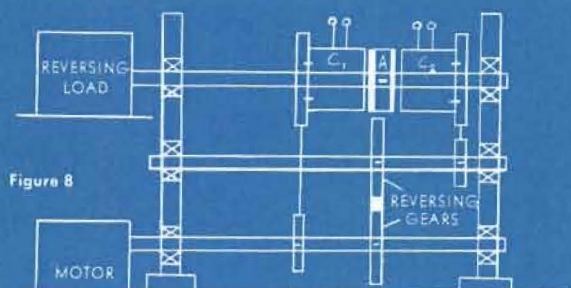


Figure 8

### DUPLEX CLUTCH (D or FFD)

This unit combines the features of two clutches in a single package. The armature is fixed to the shaft and has a friction face on each side. Both clutch magnets (C1 and C2) are driven and rotate on the shaft until a voltage is applied to one or the other. When this occurs, the armature is attracted to either C1 or C2 and the shaft turns in the direction that the energized magnet is turning. C1 and C2 turn in opposite directions.

#### TYPICAL APPLICATION - REVERSING

A load can be reversed with a duplex clutch without reversing the motor. This reversing method not only eliminates the wear and tear on starting and stopping motor in high cycle applications, but it also saves time since the motor does not have to be decelerated, reversed and accelerated each time.

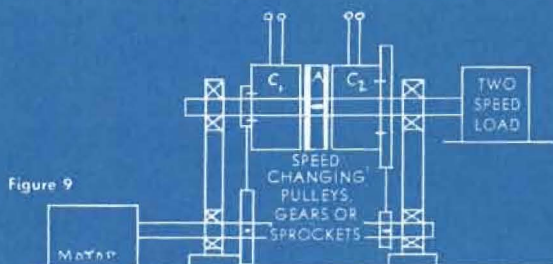


Figure 9

### DUPLEX CLUTCH (D or FFD)

In addition to reversing, the duplex clutch can be used for two speed or multiple speed applications.

#### TYPICAL APPLICATION - TWO SPEED DRIVE

One clutch magnet (C1) is driven at a high speed and the other (C2) is driven at a low speed. Rapid travel utilizes high speed clutch while accurate positioning is obtained by switching to the low speed clutch. Signals to control high speed to low speed can come from limit switches, photo pickups, magnetic pickups, punched or magnetic tape or any number of transducers which might sense distance, speed, pressure, light, sound or heat. An electric brake is often used in conjunction with the duplex clutch in this application. See figure 1.

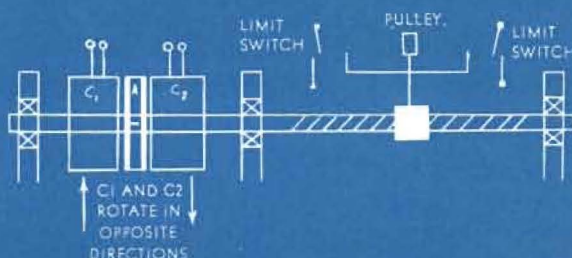


Figure 10

### DUPLEX CLUTCH (D or FFD)

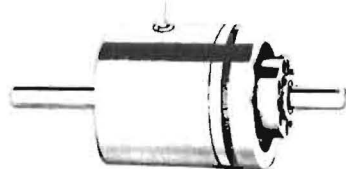
#### TYPICAL APPLICATION - TRAVERSING IN WINDING APPLICATIONS

Wire, string, rope, insulation, fiber, filaments, thread, plastics or any continuous material that is wound traversely could be fed through a traversing drive using a duplex clutch like that shown in figure 8. In the traversing drive shown in figure 10, the output shaft is a lead screw with a nut riding on it. The nut is attached to a pulley which moves between two adjustable limit switches. The limit switches energize either C1 or C2 on the duplex clutch to give reversal. The material to be wound rides on the pulley and then passes to the receiving spool. Independent voltage control on C1 and C2 can prevent build-up of material on spool sides.



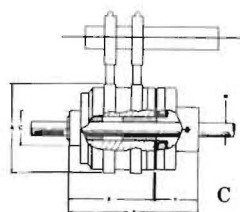
# CLUTCHES

FFC

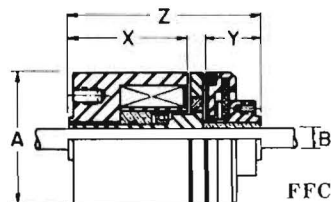


FFC20-FFC80

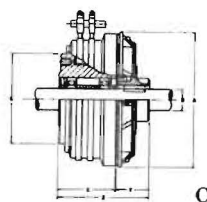
SHAFT NOT FURNISHED



C20-C80



FFC20-FFC80



C100, 130, 180

Prices for all voltages 6, 12, 24 and 90 are the same.

If transistor controls are being considered, specify 6, 12, or 24 volt units.

A completely dimensioned drawing furnished with each unit.

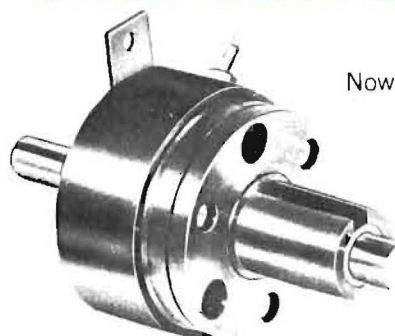
FFC

Size	Rated Static Torque	Diam. A	Shaft Diam. B	Lgth inches	Coil Power Watts	PRICE
20	10 oz. in.	7/8	.1575	1-33/64	3	48.00
30	30 oz. in.	1-3/16	.1885	1-15/16	2.3	49.00
40	115 oz. in.	1-9/16	.251	2-13/64	4.5	125.00
50	16 lb. in.	1-31/32	.3135	2-41/64	5	50.50
60	60 lb. in.	2-19/32	.5015	3-5/64	14	57.50
80	100 lb. in.	3-1/8	.626	3-33/64	15	68.00
100	20 lb. ft.	4	.7500	3-7/16	30	79.50
130	50 lb. ft.	5-3/4	1.0000	5-5/16	27	85.00

C

Size	Rated Static Torque	Diam. A	Shaft Diam. B	Lgth inches	Coil Power Watts	PRICE
20	10 oz. in.	7/8	.1575	1-13/32	2	35.50
30	30 oz. in.	1-3/16	.1885	1-53/64	2	36.00
40	115 oz. in.	1-9/16	.2510	2-3/32	4	36.50
50	16 lb. in.	1-31/32	.3135	2-17/32	5	44.50
60	50 lb. in.	2-19/32	.5015	2-29/32	12	56.00
61	75 lb. in.	2-19/32	.5015	2-31/32	18	60.50
80	100 lb. in.	3-1/8	.6260	3-9/32	14	67.50
100	20 lb. ft.	4	.6250	3-49/64	20	89.50
130	40 lb. ft.	5-1/4	.7500	4-23/64	26	105.00
160	60 lb. ft.	6-7/16	1.0000	4-9/64	27	132.50

## SINE DRIVE CLUTCH



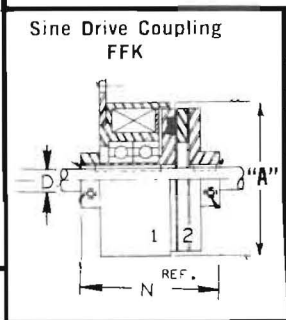
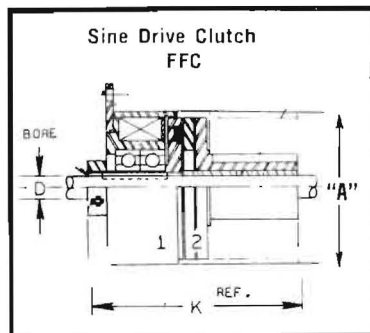
SHAFT NOT FURNISHED

Simplatrol Sine Drive is a totally new concept in electric clutch armature design. Now zero backlash, positive release (residual magnetism eliminated) and millisecond response time are all reliable performance factors.

### ADVANTAGES OF SINE DRIVE DESIGN

- Low installed cost — shaft ready, for direct attachment to standard pulleys, sprockets or gears.
- Maintenance Free — dual heavy duty sealed ball bearings in all sizes.
- High quality and appearance — completely machined and black satin finished.
- Compactness — extremely small unit with large power multiplication.

Simplatrol Sine Drive design clutches provide the most effective means of clutching in modern equipment. Ask for complete Simplatrol product line data.



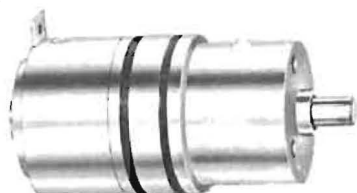
UNIT SIZE	FFC & FFK				STATIC TORQUE RATING
	A	B	K	N	
43	1 3/4	1 5/8	2 3/8	1 5/8	10 LB.-IN.
53	2 1/8	1 7/16	2 1/2	1 3/4	30 LB.-IN.
63	2 1/2	2 1/4	2 3/4	2 1/4	60 LB.-IN.
83	3 1/8	2 5/8	2 7/8	2 3/4	100 LB.-IN.

### SINE DRIVE PRICES

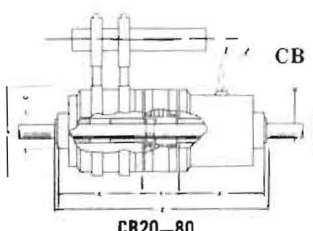
MODEL	PRICE
FFC43	\$38.50
FFC53	\$52.50
FFC63	\$61.00
FFC83	\$70.00
FFK43	\$35.00
FFK53	\$50.00
FFK63	\$58.50
FFK83	\$67.50



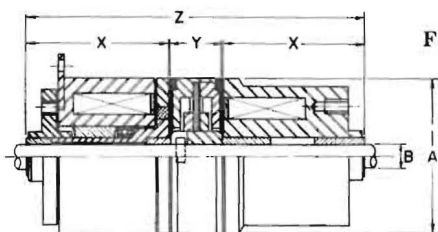
**FFCB**



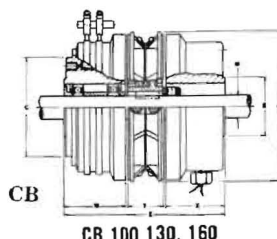
SHAFT NOT FURNISHED



CB20-80



FFCB 40, 60



CB 100 130, 160

If transistor controls are being considered, specify 6, 12, or 24 volt units.

If ball bearings are desired in brake add to prices as follows:

Sizes 100-9.50, 130-9.75, 160-10.50. All others except sizes 210, 260 and 310 have bearings.

# CLUTCH BRAKES

**CB**

Size	Rated Static Torque	Diam. A	Shaft Diam. B	Lgth inches	Coil Power Watts	PRICE
20	10 oz. in.	7/8	.1575	2-7/32	2	64.00
30	30 oz. in.	1-3/16	.1885	2-27/32	2	65.00
40	115 oz. in.	1-9/16	.2510	3-29/64	4	66.50
50	16 lb. in.	1-31/32	.3135	4-11/64	5	78.00
60	50 lb. in.	2-19/32	.5015	4-21/22	12	97.50
61	75 lb. in.	2-19/32	.5015	4-51/64	18	105.00
80	100 lb. in.	3-1/8	.6260	5-5/16	14	110.00
100	20 lb. ft.	4	.6250	6-5/64	20	148.00
130	40 lb. ft.	5-1/4	.7500	7-3/16	26	186.00
160	60 lb. ft.	6-7/16	1.0000	6-9/16	27	228.50

**FFCB**

Size	Rated Static Torque	Diam. A	Shaft Diam. B	Lgth inches	Coil Power Watts	PRICE
40	115 oz. in.	1-9/16	.250	3-29/64	4.5	81.50
60	60 lb. in.	2-9/16	.500	4-15/16	14	110.50

Prices for all voltages 6, 12, 24 and 90 are the same.  
Sizes 20 to 80 have sleeve bearings as standard.

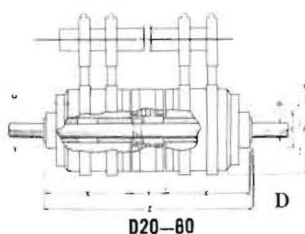
# DUPLEX CLUTCHES



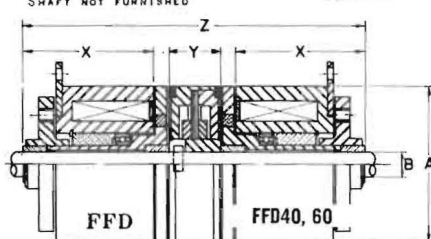
FFD40, 60



D20-80

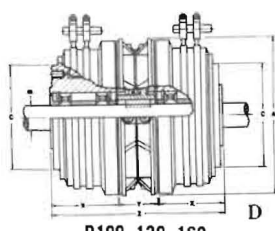


D20-80



FFD

FFD40, 60



D100, 130, 160

Prices for all voltages 6, 12, 24 and 90 are the same.

All duplex clutches have bearings.

If transistor controls are being considered, specify 6, 12, or 24 volt units.

**D**

Size	Rated Static Torque	Diam. A	Shaft Diam. B	Lgth inches	Coil Power Watts	PRICE
20	10 oz. in.	31/32	.1575	2-7/32	2	68.00
30	30 oz. in.	1-9/32	.1885	2-27/32	2	69.00
40	115 oz. in.	1-21/32	.2510	3-29/64	4	70.00
50	16 lb. in.	2-1/16	.3135	4-11/64	5	80.00
60	50 lb. in.	2-1/2	.5015	4-21/32	12	102.50
61	75 lb. in.	2-5/8	.5015	4-51/64	18	110.00
80	100 lb. in.	3-1/8	.6260	5-1/4	14	115.00
100	20 lb. ft.	4	.6250	6-17/64	20	157.50
130	40 lb. ft.	5-1/4	.7500	7-7/32	26	196.00
160	60 lb. ft.	6-7/16	1.000	6-21/32	27	241.00

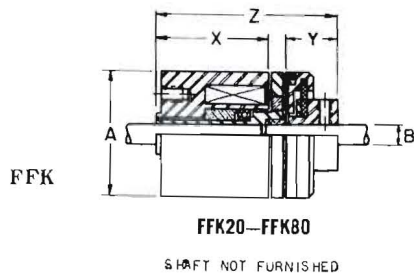
**FFD**

Size	Rated Static Torque	Diam. A	Shaft Diam. B	Lgth inches	Coil Power Watts	PRICE
40	115 oz. in.	1-9/16	.250	3-29/64	4.5	99.00
60	60 lb. in.	2-19/32	.500	5-7/32	14	125.00



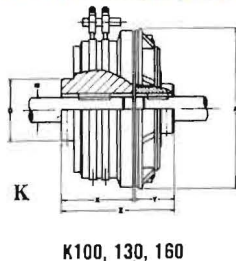
# CLUTCH COUPLINGS

## FIXED FIELD COUPLING



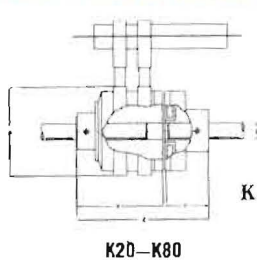
K						
Size	Rated Static Torque	Diam. A	Shaft Diam. B	Lgth inches	Coil Power Watts	PRICE
20	10 oz. in.	7/8	.1575	1-25/64	2	35.00
30	30 oz. in.	1-3/16	.1885	1-3/4	2	35.50
40	115 oz. in.	1-9/16	.2510	1-59/64	4	36.00
50	16 lb. in.	1-31/32	.3135	2-1/4	5	44.00
60	50 lb. in.	2-19/32	.5015	2-57/64	12	55.50
61	75 lb. in.	2-19/32	.5015	2-61/64	18	60.00
80	100 lb. in.	3-1/8	.6260	3-23/64	14	67.00
100	20 lb. ft.	4	.626	3-53/64	20	89.00
130	40 lb. ft.	5-1/4	.7515	4-33/64	26	104.50
160	60 lb. ft.	6-7/16	1.001	4-29/64	30	132.00

## CLUTCH COUPLING



K100, 130, 160

## CLUTCH COUPLING



K20-K80

Prices are F.O.B. New York, N. Y.

If transistor controls are being considered, specify 6, 12, or 24 volt units.

Prices for all voltages 6, 12, 24 and 90 are the same.

FFK						
Size	Rated Static Torque	Diam. A	Shaft Diam. B	Lgth inches	Coil Power Watts	PRICE
20	10 oz. in.	7/8	.1575	1-17/32	2.3	47.50
30	30 oz. in.	1-3/16	3/16	1-61/64	2.5	48.50
40	115 oz. in.	1-9/16	.251	2-13/64	4.5	50.00
50	16 lb. in.	1-31/32	.3135	2-41/64	5	57.00
60	60 lb. in.	2-19/32	.5015	3-5/64	14	67.50
80	100 lb. in.	3-1/8	.626	3-33/64	13	79.00
100	20 lb. ft.	4	5/8	3-17/64	30	82.50
130	40 lb. ft.	5-1/4	3/4 of 1	4-7/16	27	120.00

# CONTROLS FOR SIMPLATROL PRODUCTS



POWER CONVERTER

UNIT NO.	INPUT A.C.	OUTPUT D.C.	MAX. MILLIAMPS	MAX. WATTS	ENCLOSURE	LIST PRICE EA.
PC90-350	110	90	350	31.5	5" x 4" x 3"	\$15.00
PC90-350-S	110	90	350	31.5	7 3/4" x 7 3/4" x 3 5/8"	39.75
PC90-350-D	110	90	350	31.5	10 3/8" x 8 1/4" x 3 5/8"	75.00
PC90-350-ST	440/220	90	350	31.5	7 3/4" x 7 3/4" x 3 5/8"	56.50
PC90-350-DT	440/220	90	350	31.5	10 3/8" x 8 1/4" x 3 5/8"	82.50
PC24-600	110	24	600	14.4	5" x 4" x 3"	18.00
PC24-500-S	110	24	500	12.0	5" x 4" x 3"	29.50
PC24-900-S	110	24	900	21.6	7" x 5" x 3"	49.50

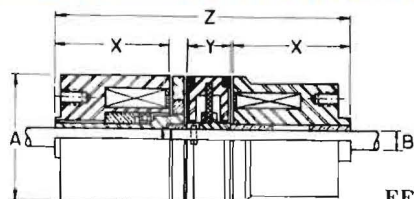
## SIZE UNIT TO BE USED WITH CONVERTER

90 VOLT DC COIL		24 VOLT DC COIL		24 VOLT DC COIL		24 VOLT DC COIL	
PC90-350 SERIES		PC24-600		PC24-500-S		PC24-900-S	
TYPE	SIZE	TYPE	SIZE	TYPE	SIZE	TYPE	SIZE
ROTARY FIELD	ALL	ROTARY FIELD	20 TO 60 AND 80	ROTARY FIELD	20 TO 60	ROTARY FIELD	61 AND 80 TO 160
FIXED FIELD	ALL	FIXED FIELD	20 TO 50 AND 80	FIXED FIELD	20 TO 50	FIXED FIELD	60 AND 80



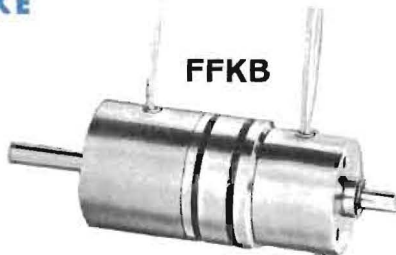
# COMBINATION COUPLINGS - BRAKES

## FIXED FIELD COUPLING-BRAKE



FFKB20-80

FFKB



FFKB

FFKB20-80

SHAFT NOT FURNISHED

Prices are F.O.B. New York, N. Y.

Prices for all voltages 6, 12, 24 and 90 are the same.

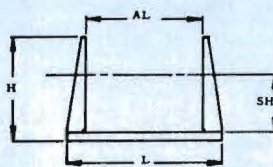
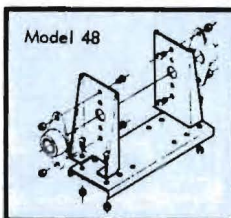
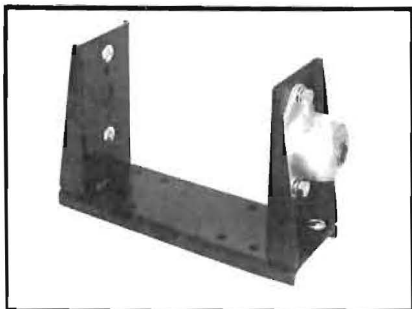
If transistor controls are being considered, specify 6, 12, or 24 volt units.

Bearings are furnished in the brake section.

FFKB

Size	Rated Static Torque	Diam. A	Shaft Diam. B	Lgth inches	COIL POWER WATTS		*PULL-IN TIME MILLISECONDS		PRICE EACH
					COUPLING	BRAKE	COUPLING	BRAKE	
20	10 oz. in.	7/8	.1575	2-11/32	3	2	7	10	\$76.50
30	30 oz. in.	1-3/16	.1885	2-63/64	2.3	2	12	12	77.50
40	115 oz. in.	1-9/16	.2510	3-9/16	4.5	4	20	14	81.00
50	16 lb. in.	1-31/32	.3135	4-9/32	5	5	23	20	92.50
60	60 lb. in.	2-19/32	.5015	4-27/32	14	12	25	25	110.00
80	100 lb. in.	3-1/8	.6260	5-31/64	15	14	60	50	129.50

## BRACKETS



	MODELS	
	48	1016
AL	2 - 6	5 - 9
L	8	13
SH-shaft height	3	5
H	5 - 1/2	8 - 1/2
Width	3 - 1/8	5 - 1/2

These simple, easy-to-assemble adjustable mounting brackets have been designed to reduce the installation cost and time for a wide range of SIMPLATROL electric clutches and brakes. Models 48 and 1016 are available.

Use Model 48 for sizes 40, 50, 60, 61 and 80. Use Model 1016 for sizes 100, 130 and 160.

### GENERAL INFORMATION

- Model 48 is made of 3/32" thick steel. Model 1016 is made of 1/8" thick steel. Both models are finished with a black crackle paint.
- Both models are furnished with two, self-aligning bearings. Model 48 has bronze bearings. Model 1016 has ball bearings. Model 48 is available with ball bearings at an additional charge of \$7.75 a set.
- Model 1016 can be used with sizes 60, 61 and 80 if additional length or shaft height is required.
- Mounting and assembly information is furnished with each bracket.
- Check maximum length and diameter (include gears, sprockets, pulleys etc.) of electric clutch and/or brake assembly to be supported to assure that the proper size mounting bracket has been selected.
- Refer to SIMPLATROL drawings for additional information. SIMPLATROL clutches and brakes have tapped holes which facilitate fixed mounting of brakes and the mounting of gears, sprockets and pulleys to the clutches.

MODEL 48: (BRONZE BEARINGS) \$19.75 . MODEL 48: (BALL BEARINGS) \$27.50 MODEL 1016: (BALL BEARINGS) \$28.75

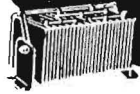
When ordering specify bracket model, Simplatrol clutch and/or brake size and whether model 48 should have ball bearings. Do not use brackets with clutch-couplings or coupling-brakes Styles K, FFK or FFKB.



# SILICON RECTIFIERS

# SELENIUM RECTIFIERS

**DIRECTRON**



## FEATURES

- High operating temperature, 190°C (Up to 120°C ambient)
- High operating voltage (Up to 600 p.i.v.)
- High efficiency (99% compared to about 75% for selenium)
- Excellent regulation (4% compared to about 15% for selenium)

Stock No.	Type	AC Input Volts up to	DC Output Volts up to	Max. Amps Self Cooled	Max. Amps Fan Cooled	Size And Weight	User Net Price
SI-CT-A	Center-Tap	18-0-18	16	40	80	B	\$ 15.00
SI-CT-B	Center-Tap	36-0-36	32	40	80	B	20.00
SI-CT-A	Center-Tap	18-0-18	16	50	100	B	17.50
SI-CT-B	Center-Tap	36-0-36	32	50	100	B	22.50
SI-CT-D	Center-Tap	72-0-72	64	50	100	B	36.00
SI-CT-F	Center-Tap	140-0-140	125	50	100	B	44.00
SK-CT-A	Center-Tap	18-0-18	16	100	200	C	30.00
SK-CT-B	Center-Tap	36-0-36	32	100	200	C	34.00
SK-CT-D	Center-Tap	72-0-72	64	100	200	C	37.00
SK-CT-F	Center-Tap	140-0-140	125	100	200	C	48.00
SM-CT-A	Center-Tap	18-0-18	16	200	400	D	45.00
SM-CT-B	Center-Tap	36-0-36	32	200	400	D	60.00
SM-CT-D	Center-Tap	72-0-72	64	200	400	D	62.00
SM-CT-F	Center-Tap	140-0-140	125	200	400	D	76.00
SO-CT-B	Center-Tap	36-0-36	32	400	800	E	100.00
SA-BR-D	1φ Bridge	140	125	1	—	—	9.00
SA-BR-F	1φ Bridge	280	250	1	—	—	10.50
SC-BR-D	1φ Bridge	140	125	2	—	—	10.50
SC-BR-F	1φ Bridge	280	250	2	—	—	12.00
SD-BR-A	1φ Bridge	36	32	6	12	F	18.00
SD-BR-D	1φ Bridge	140	125	6	12	F	30.00
SD-BR-F	1φ Bridge	280	250	6	12	F	39.00
SE-BR-A	1φ Bridge	36	32	10	20	G	21.00
SE-BR-D	1φ Bridge	140	125	10	20	G	36.00
SE-BR-F	1φ Bridge	280	250	10	20	G	44.00
SF-BR-A	1φ Bridge	36	32	20	40	H	24.00
SF-BR-D	1φ Bridge	140	125	20	40	H	40.00
SF-BR-F	1φ Bridge	280	250	20	40	H	48.00
SI-BR-A	1φ Bridge	36	32	40	80	J	30.00
SI-BR-B	1φ Bridge	72	64	40	80	J	36.00
SI-BR-D	1φ Bridge	140	125	40	80	J	63.00
SI-BR-F	1φ Bridge	280	250	40	80	J	95.00
SL-BR-A	1φ Bridge	36	32	50	100	J	33.00
SL-BR-B	1φ Bridge	72	64	50	100	J	39.00
SL-BR-D	1φ Bridge	140	125	50	100	J	70.00
SL-BR-F	1φ Bridge	280	250	50	100	J	110.00
SG-BR-A	1φ Bridge	36	32	70	140	J	40.00
SG-BR-B	1φ Bridge	72	64	70	140	J	50.00
SG-BR-D	1φ Bridge	140	125	70	140	J	80.00
SG-BR-F	1φ Bridge	280	250	70	140	J	130.00
SK-BR-A	1φ Bridge	36	32	100	200	K	60.00
SK-BR-B	1φ Bridge	72	64	100	200	K	68.00
SK-BR-D	1φ Bridge	140	125	100	200	K	90.00
SK-BR-F	1φ Bridge	280	250	100	200	K	150.00
SM-BR-A	1φ Bridge	36	32	200	400	L	100.00
SM-BR-B	1φ Bridge	72	64	200	400	L	120.00
SM-BR-D	1φ Bridge	140	125	200	400	L	180.00
SM-BR-F	1φ Bridge	280	250	200	400	L	260.00
SO-BR-B	1φ Bridge	72	64	400	800	M	270.00
SO-BR-F	1φ Bridge	280	250	400	800	M	480.00
SL-PH-A	3φ Bridge	36	48	75	150	N	60.00
SL-PH-B	3φ Bridge	72	96	75	150	N	85.00
SL-PH-C	3φ Bridge	105	144	75	150	N	120.00
SL-PH-D	3φ Bridge	140	188	75	150	N	180.00
SL-PH-E	3φ Bridge	220	290	75	150	M	220.00
SK-PH-E	3φ Bridge	220	290	100	200	M	240.00
SM-PH-E	3φ Bridge	220	290	200	400	M	300.00
SO-PH-E	3φ Bridge	220	290	400	800	M	375.00

All above ratings based on 30°C ambient. Fan-cooled ratings based on air velocity of 1000 linear ft./minute. For resistive or inductive loads, as rated. For capacitive or battery loads, derate amperage 20%. Doublers, triplers, 3 phase half wave and 3 phase center tap also available. Custom built stacks, 24 hour service.

## DIMENSIONS WITH BRACKETS

Size	Length	Height	Width	Weight
B	3"	6"	5"	12 oz.
C	3"	6"	6"	1 lb.
D	4"	8"	7"	2 lbs.
E	4"	9"	8"	6 lbs.
F	6"	5"	5"	1 1/2 lbs.
G	6"	6"	5"	1 1/2 lbs.
H	6"	6"	6"	2 lbs.
J	6"	8"	7"	4 lbs.
K	8"	9"	8"	6 lbs.
L	8"	11"	10"	6 lbs.
M	8"	6"	5"	4 lbs.

\*Not suitable for fan-cooling

## FULL WAVE BRIDGE RECTIFIERS, SINGLE PHASE, RESISTIVE-INDUCTIVE LOADS

Max. Amps.	18v. in— 14v. out		36v. in— 28v. out		54v. in— 42v. out		130v. in— 100v. out	
	No.	Price	No.	Price	No.	Price	No.	Price
1/2.....	A 18.....	\$ 1.05	A 36.....	\$ 1.50	A 54.....	\$ 2.50	A 130.....	\$ 5.00
1.....	B 18.....	1.20	B 36...	2.20	B 54.....	3.20	B 130....	8.00
2.....	C 18....	2.10	C 36...	3.00	C 54.....	4.50	C 130....	10.00
3.....	D 18....	2.70	D 36...	4.00	D 54.....	6.00	D 130....	14.00
4.....	E 18....	3.60	E 36...	7.50	E 54.....	10.00	E 130....	24.00
6.....	F 18....	4.50	F 36...	9.00	F 54.....	12.00	F 130....	32.00
10.....	G 18....	6.60	G 36...	12.00	G 54.....	18.00	G 130....	39.00
12.....	H 18....	8.20	H 36...	16.00	H 54.....	22.00	H 130....	44.00
15.....	J 18....	10.50	J 36...	20.00	J 54.....	27.00	J 130....	54.00
20.....	K 18....	12.50	K 36...	25.00	K 54.....	36.00	K 130....	77.00
24.....	L 18....	15.00	L 36...	30.00	L 54.....	42.00	L 130....	82.00
30.....	M 18....	19.10	M 36...	37.00	M 54.....	55.00		
36.....	P 18....	24.00	P 36...	48.00				
50.....	R 18....	30.00	R 36...	60.00				

220 v. Single Phase available . . . up to 1000 amps.  
**HALF-WAVE, CENTER-TAP, DOUBLER, TRIPLER or 3-PHASE**  
 Quotations on request

Transformers are with 2 — 18 volt center-tapped windings. Connected in series delivers 36 volts as rated. Connected in parallel — delivers 18 volts at twice rated current. (Taps 9, 18, 27, 36 V.)  
 Primary taps at 100, 105, 110 and 115 volts available on 12 amp, 24 amp, 30 amp and 50 amp transformers. No extra charge.

Part No.	Amps.	Users Net Price
18 T 1	1	\$ 5.25
18 T 2	2	7.20
18 T 4	4	8.75
18 T 8	8	15.00
18 T 12	12	16.75
18 T 24	24	35.75
18 T 30	30	45.00
18 T 50	50	54.00

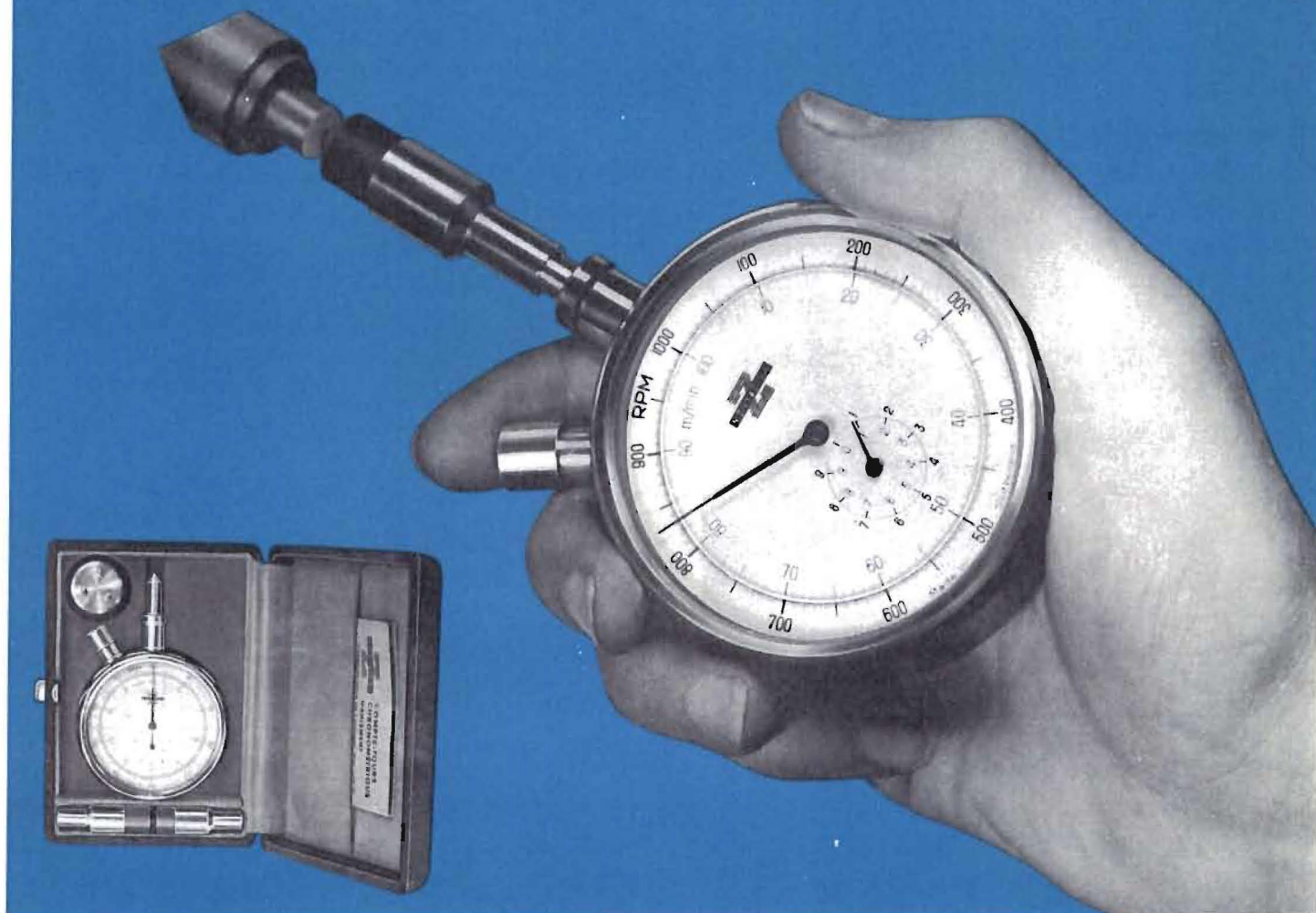
Part No.	Amps.	Hy.	Ohms	Users Net Price
CK 1	1	.1	1.5	\$ 4.95
CK 2	2	.04	.9	6.00
CK 4	4	.07	.6	7.95
CK 8	8	.03	.3	12.00
CK 12	12	.01	.1	14.95
CK 20	20	.004	.05	15.00
CK 24	24	.004	.025	27.00
CK 30	30	.003	.01	36.00
CK 50	50	.001	.001	45.00
CK 100	100	.0005	.005	54.00

## STEP UP TRANSFORMERS

PRIMARY WINDINGS			100-105-110-115 VOLT		
SECONDARY WINDINGS			130-135-140 VOLT		
Part No.	Amps.	Users Net Price	Part No.	Amps.	Users Net Price
SU 10	10	65.00	SU 25	25	120.00
SU 15	15	80.00	SU 30	30	150.00
SU 20	20	105.00	SU 35	35	175.00



# CHRONOMETRIC SPEED COUNTER



## CHRONOMETRIC SPEED COUNTER ZIVY

High precision speed indicator for automatic, accurate measurement of rotary, peripheral and cutting speeds.

### Principle:

The ZIVY speed indicator is intended to furnish exceptional accurate measurement of constant speeds, revolutions or feet (meters) per minute in a few seconds' time.

It is based on the positive measurement principle, registering the result of directly measured rotary and surface speeds, divided by directly measured time.

Three major elements constitute the mechanism, a precise timing movement, an accurate revolution counter and an automatic synchronizing system.

### Advanced design and construction:

A directional converter causes the indicating hands to rotate clockwise regardless of the direction of the spindle. Knife edge indicating

hands. Shatterproof, chip-proof dial with finely graduated scale. Shock-proof case — die cast from Duralinox with deep knurling provide a firm grip. Ball bearings at the spindle minimize friction and insure continued dependability. Only one button. Makes instrument easier, more convenient to handle more nearly automatic.

Protectively packaged in a pocket fit sized carrying case, weight: 380 gr.

### Dial:

∅ (diameter) 2-3/16" with two divisions:  
black scale = RPM  
red scale = rotary, periphery or cutting speed in FPM or MPM

### Reading:

The large hand (outer scale) indicates both revolutions per minute and feet (meters) per minute.

The small hand counts the revolutions of the large hand. One division of the small inner scale represents one whole revolution of the large hand. If the speed attained exceeds the dial range the hands move around the dial

again, registering the speed. The overspeed allowance is 100%.

### PRICES

TYPE A	0-10,000 RPM, 0-3,000 FPM	\$70.00
TYPE B	0-1,000 RPM, 0-300 FPM	\$70.00
TYPE C	0-200 RPM, 0-30 FPM	\$80.00

ACCURACY 0.5%

### Operation:

Bring the spindle, fitted with the most suitable tip, in contact with the center of the rotating object and as nearly parallel to its axis as possible. Very little pressure is required, a light even contact is preferable.

Press the button gently, then release it quickly. Allow the tip on the spindle to remain in contact with the rotating object until the indicating hands stop, at which time the result may be read.

Since the hands remain in the position at which they stopped until the button is again pressed and quickly released, full opportunity is provided to the operator for an unhurried and precise reading of the exact result.



# SPEED - MATE MECHANICAL VARIABLE SPEED DRIVE

(Sub-Fractional H.P. Zero—Max.)

## WITH MOTOR

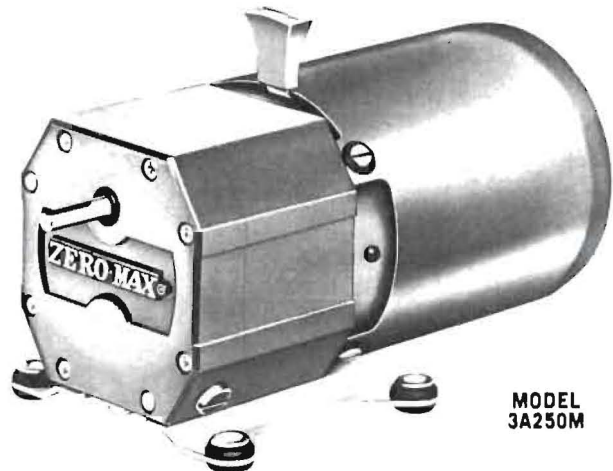
Standard Motorized Speed-Mate drives (Model AM) are compact, quiet, positive and dependable stepless speed reducers delivering 3 inch pounds of torque over a speed range of 0 to 250 rpm. This complete power package is ideally suited for subfractional horsepower variable speed applications. The motorized drive saves money by eliminating items to be procured, simplifying alignment, and reducing space requirement. Your choice of CW or CCW output rotation must be specified when ordering. Speed-Mate output shafts will support an overhung load of 10 lbs. at the midpoint of the shaft and 10 lbs. of thrust load.

The Motorized Speed-Mate is integrally joined to a fan cooled, 2-pole, shaded pole, 115 volt, 60 cycle, single phase, 3000 rpm 1/2 hp motor. A HI-START coupling between the motor and Speed-Mate doubles the starting torque by permitting the motor to turn before it picks up the Speed-Mate and load. A 2:1 spur gear stepover reduction from motor shaft to Speed-Mate input shaft reduces the input speed to 1500 rpm and further increases the starting torque of the motor.

A 3" ten blade fan operating in a specially designed cooling assures maximum movement of air around the motor and drive. The Speed-Mate housing runs warm to the touch — up to 140° F. — while the moulded motor housing remains cool.

Model AM Speed-Mate drives can be run in any position. Be sure there is a proper ground connection from the motor. Thermal protection with automatic reset is standard on all Model AM units. Consult the factory about the availability of Model AM drives with 230 volt and 50 cycle motors.

## STANDARD MODEL AM



Running Torque* In. Lbs.	Speed Range (1500 rpm Input)	Catalog Number		Net Weight Lbs.***	PRICE
		Model	Output Rotation**		
3	0-250	3A250M	CCW or CW (Specify)	6 1/2	\$62.00

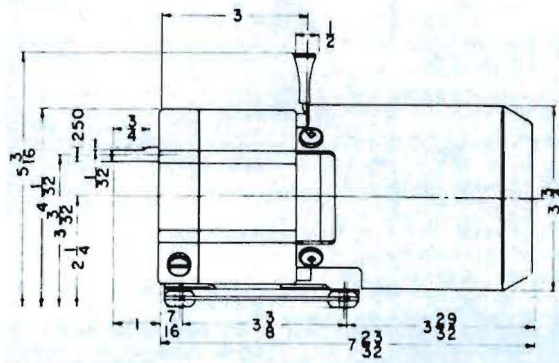
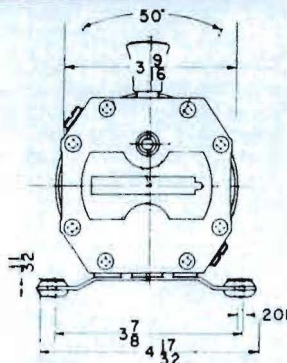
Above has 115 volt, 60 cycle, single phase 2-pole shaded pole motor with HI-START coupling and thermal protection. Lever control is standard. Specify if optional PRECI-SCREW control (page 6) is wanted.

\*See Fig. 12, page 4, for starting torque curve of Model AM.

\*\*Always read rotation facing end of the shaft.

\*\*\*For shipping weight add 1 lb.

## DIMENSIONS



These dimensions are only for reference purposes and are subject to change without notice. For construction purposes request certified prints.

**GUARANTEE — SPEED-MATE** drives, motors and gearheads are guaranteed for one year against defective workmanship, or material. Transportation is not allowed. Factory has final approval on warranty repairs. Disassembly voids guarantee. The guarantee covers only the repair or replacement of the drive.



### WITH GEARHEAD

Speed-Mate Gearhead drives, both with or without motor (Models ASM and AS) offer greater torque and finer control where less than the full speed range of 0-250 rpm of the standard Speed-Mate is required. Compact, self-contained, and interchangeable EASI-MOUNT gearheads are available in three ratios and may be purchased mounted on the Speed-Mate (Models ASM and AS), or separately for mounting on either Models AXM or AX. They cannot be mounted on Models AM and A because the output shaft is not cut to function as a stem pinion.

EASI-MOUNT gearheads have hardened steel spur gears on ground shafts operating in cast cases. They contain their own lubrication. EASI-MOUNT 3/16

o.d. gearhead output shafts will support an overhang load of 15 lbs. at the midpoint of the shaft and 15 lbs. of thrust load.



FIG. 27

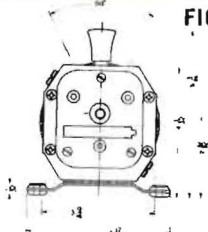


FIG. 28

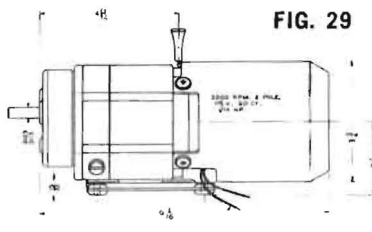


FIG. 29

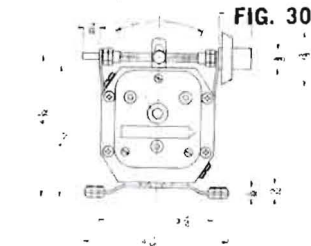


FIG. 30

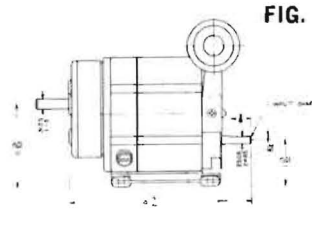


FIG. 31

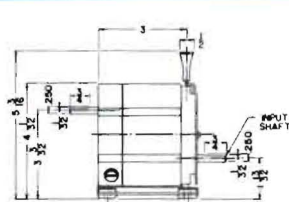
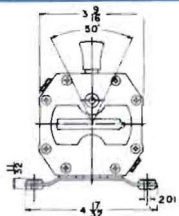
These dimensions are only for reference purposes and are subject to change without notice. For construction purposes request certified prints.

### WITHOUT MOTOR

Speed-Mate drives without motor (Model A) may be used where a power source is already available or a special motor is required. Torque rating is 3 inch pounds and speed range is 0 to 1/6 input speed with a recommended minimum input of 400 and a maximum of 2000 rpm. Use CW input (facing shaft only) on Speed-Mate Model A-CW drives and CCW input on Model A-CW drives. Speed-Mate output shafts will support an overhang load of 10 lbs. at the midpoint and 10 lbs. of thrust load.

Motor or power source may be coupled directly using a flexible coupling or indirectly by using belt, chain or gears.

For best results use a 1500 to 1800 rpm input and maximum reduction on the output shaft commensurate with your maximum speed need.



### Drive Without Motor\* and Without Gearhead

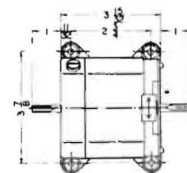
Running Torque In. Lbs.	Speed Range (With 1500 rpm Input)	Catalog Number		Net Weight Lbs.***	PRICE
		Model	Output Rotation**		
3	0-250	3A250	CCW or CW (Specify)	3	\$39.00

Lever control is standard. Specify if optional PRECI-SCREW control is wanted.

\*Maximum recommended motor hp at input is 1/2 hp at 1800 rpm (48 in. oz. torque). Minimum recommended torque at input for light load low speed applications is 16 in. oz.

\*\*Always read rotations facing the end of the shaft.

\*\*\*For shipping weight add 1 lb.



FACTORY ASSEMBLED GEARHEAD MODELS					
	Torque* (In. Lbs.)	Speed Range RPM (With 1500 rpm Input)	Catalog Number		Net Weight Lbs.***
			Model	Rotation**	
WITH MOTOR	5	0-40	5AS40M	CCW or CW (Specify)	7 1/2
	10	0-10	10AS10M	CCW or CW (Specify)	7 1/2
	15	0-2.5	15AS2.5M	CCW or CW (Specify)	7 1/2
WITHOUT MOTOR*	5	0-40	5AS40	CCW or CW (Specify)	4 1/2
	10	0-10	10AS10	CCW or CW (Specify)	4 1/2
	15	0-2.5	15AS2.5	CCW or CW (Specify)	4 1/2

### SPECIAL SPEED-MATE AND GEARHEAD COMPONENTS FOR FIELD ASSEMBLY

The following Speed-Mate models have stem pinion output shafts for insertion into EASI-MOUNT gearheads. Add Gearhead price from below.

	Model	Speed Range (With 1500 rpm Input)	Output Rotation**	Net Weight Lbs.***
WITH MOTOR	Model 3AX250M (3" x 0-250 rpm)		CCW or CW (Specify)	5 1/2
WITHOUT MOTOR*	Model 3AX250 (3" x 0-250 rpm with 1500 rpm In.)		CCW or CW (Specify)	3

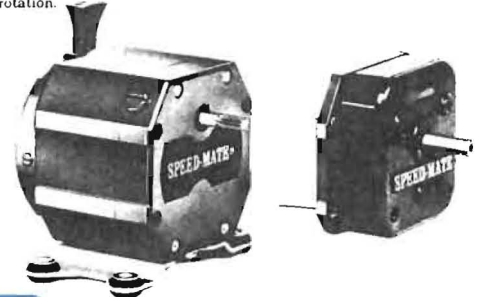
The following EASI-MOUNT Gearheads (Fig. 32) are for interchangeable use with above Speed-Mate models.

Model S40	Increases Torque rating to 5 in. lbs. and reduces speed range to 0-40 rpm	\$15.00
Model S10	Increases Torque rating to 10 in. lbs. and reduces speed range to 0-10 rpm	\$15.00
Model S2.5	Increases Torque rating to 15 in. lbs. and reduces speed range to 0-2.5 rpm	\$15.00

Lever control is standard. Specify if optional PRECI-SCREW control is wanted.

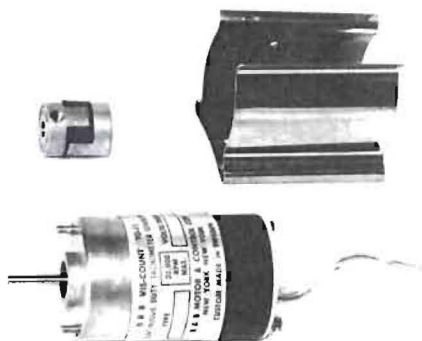
\*Maximum recommended motor hp at input is 1/2 hp at 1800 rpm (48 in. oz. torque). Minimum recommended torque at input for light load low speed application is 16 inch ounces.

\*\*Always read rotations facing the end of the shaft. Gearheads do not change the direction of Speed-Mate output rotation.

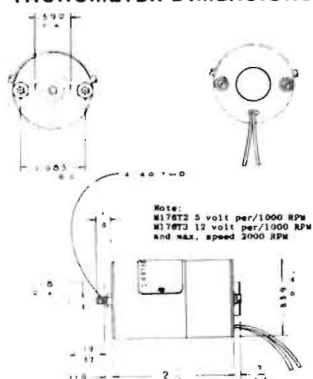




## B & B VIS - COUNT SPEED INDICATING SYSTEM



### TACHOMETER DIMENSIONS



M176T1 PM DC Tach Generator  
2 lead reversible  
2.5 volt per 1000 RPM  
Max. speed 5000 RPM cont. duty  
Ball bearings-ceramic magnet  
Silver graphite brushes  
Standard shaft diameter .118  
Range available from .109 to .114  
Standard shaft extension 19/32  
Max. extension 19/32"

### B & B VIS-COUNT SPEED INDICATING SYSTEM

**B & B VIS-COUNT SPEED INDICATING SYSTEM**  
A high quality, rugged 1% accuracy system for continuous visual indication of rotating speeds.

**Briefly:**

The Vis-Count speed indicator is a factory calibrated system consisting of a precision-built tachometer generator, and a 4½" meter. This tachometer-generator is connected to the rotating shaft whose speed is to be measured. The meter then indicates the speed. A shaft coupling and a tachometer mounting clamp are included.

**Specifications:**

The tachometer generator, since it is the heart of the system, is most important. The Vis-count tach-generator is a ball bearing precision instrument. Its stabilized ceramic magnets can't be damaged by short circuits or overloads. Silver graphite brushes assure accurate signal. The voltage output is linear within  $\pm 0.05\%$ . (See graph.) Recent self-heating tests report the following: "With a 50 milliamper load at 3000 RPM after 2 hours, a temperature rise of 17 degrees C was recorded, and during the two-hour period, there was no appreciable voltage change. (That is, no voltage change that a  $\pm 1\%$  indicating meter could detect.) For ambient temperature change from 25°C to 95°C the M176T1 will maintain its voltage output within 1% at any given load. Life tests on M176 tach-generators at various speeds up to 10,000 RPM with 5 milliamper load have consistently resulted in brush life equivalent to 100,000 hours at 3000 RPM. For most applications an average brush life of  $10^{10}$  revolutions may be expected.

**Speed Indicator:**

The precision 4½" meter is custom made to our specifications. D'Arsonval movement is standard. All meters are damped and are accurate to within  $\pm 1\%$  of full scale reading. A calibrating potentiometer is located at rear of meter so that re-calibration can be made in the field if necessary. See figure 2.

**Connections:**

The tach-generator is connected to a two-conductor, 20-foot jacketed cable which is wired to the indicating meter. No connections are made by you.

**Mounting:**

A cadmium plated beryllium copper mounting bracket is supplied for mounting the tach-generator to any surface. (See figure 3). The 4 1/2" meter is supplied in an aluminum meter box for use on a bench. (See figure 4). For use in a panel, please state so on order.

**Tachometer Generator models available:**

M176T1—2.5 volts per/1000 RPM for direct connection to shafts rotating up to 7500 RPM.

M176T2—5.0 volts per/1000 RPM for direct connection to shafts rotating up to 2000 RPM.

M176T3—12.0 volts per/1000 RPM for direct connection to shafts rotating up to 1000 RPM.

M176T4—20.0 volts per/1000 RPM for direct connection to shafts rotating up to 500 RPM.

**Meters available:**

0-5, 0-10, 0-50, 0-100, 0-250, 0-500, 0-1000, 0-1500, 0-2000, 0-2500, 0-5000, 0-10000, RPM. Any meter can be made to your specifications within 48 hours; such as inches/minute, feet/hour, pieces/hour, 0-100%, etc. Consult our sales department.

**Prices:**

The complete system including a M176 tachometer generator with 20 feet of 2 conductor cable, 4 1/2" indicating meter housed in meter box, beryllium copper mounting plate and coupling:

with M176T1	\$87.50	each system
M176T2	\$87.50	each system
M176T3	\$89.50	each system
M176T4	\$94.50	each system

Cable lengths up to 500 feet can be supplied; add 5c per foot. Deduct the following prices if you wish to delete any of the following:

Coupling—deduct \$2.00  
Mounting plate—deduct \$2.50  
Meter box—deduct \$3.50

**Important:**

Before ordering. — The coupling is supplied with one side to fit the tach-generator. Please specify if the other side is to be 3/16", 1/4", 5/16", or 3/8" bore. Do you want reversing? What is speed of your driver shaft to compare to on indicating meter?



# HELLER SPEED CONTROL PLUS

## VIS-COUNT SPEED INDICATING TACHOMETER SYSTEM



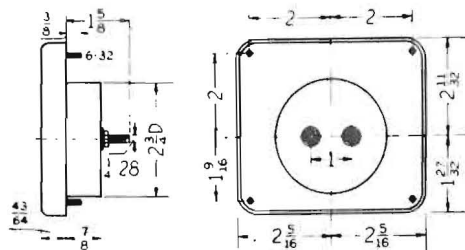
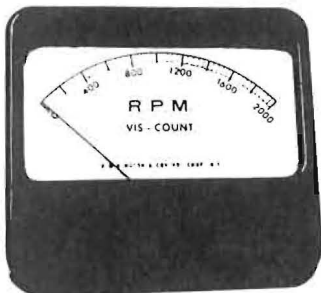
PRICE FOR METER AND GENERATOR  
MOUNTED ON ANY BODINE MOTOR \$171.00  
ADD PRICE OF MOTOR FOR TOTAL PRICE.  
BE SURE TO SPECIFY METER  
CALIBRATION DESIRED

Mounting our Tachometer Generator on any Motor in this catalog and combining it with a Heller Controller, you know at a glance the exact speed the Motor is running at and you can change the speed merely by turning a knob. In other words, the B & B "VIS-COUNT" TACHOMETER SYSTEM, gives you infinitely variable speeds (within speed range of Motor) while at the same time showing you at a glance the exact speed at which the Motor is running.

Completely packaged and ready for immediate delivery all you need do, is to plug the system into your AC lines. Nothing more.

Available mounted on any Motor in this catalog, along with any Controller, the B & B "VIS-COUNT" TACHOMETER SYSTEM, is setting new standards thruout industry for accurate, low cost speed control.

## VIS - COUNT METERS



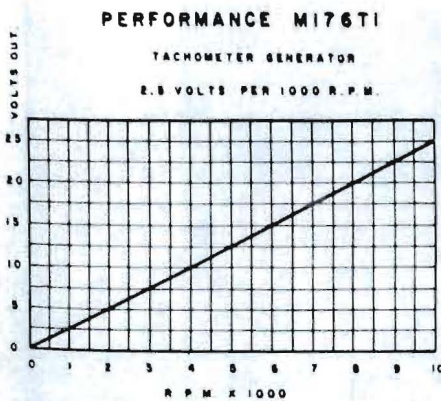
### STANDARD DIAL CALIBRATIONS

0 - 5	0 - 10	0 - 25
0 - 50	0 - 100	0 - 200
0 - 250	0 - 300	0 - 500
0 - 750	0 - 1000	0 - 1200
0 - 2000	0 - 2500	0 - 4000
0 - 5000		

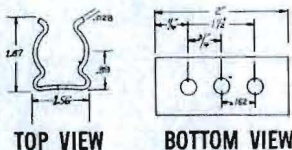
EXTRA STANDARD METERS \$45.00

Add 10.00 additional for meters with special calibrations.

LARGE 4 1/2" EASY TO READ METER —  
SILK SCREENED NUMBERS

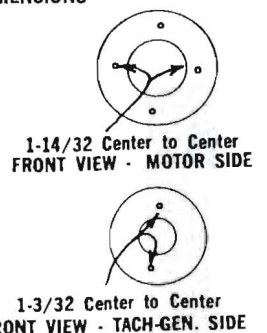
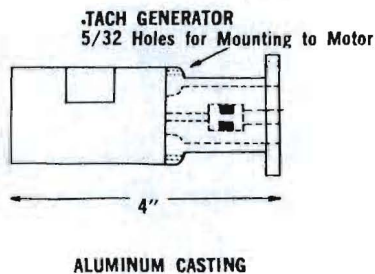


### TACHOMETER CLIP



**STEEL SLOPING  
PANEL CABINET**  
No 20 Gauge Steel  
Black Wrinkle Finish  
5-3/16" x  
4-1/16" x  
4-5/16"

### TACHOMETER BRACKET MOUNTING DIMENSIONS



### TACHOMETER GENERATOR

The B.B. Motor and Control Corp. Tachometer Generator provides a D.C. output voltage that is directly proportional to the speed of the motor, thus permitting the speed of the motor to be read from a calibrated voltmeter. The above dimension should be added to the overall length of the motor used.



# CONTROLS FOR VARIABLE SPEED MOTORS

To assist you in selecting the proper control for the motor you require, we have briefly described here the types of variable speed motor controllers. Since the descriptions are quite brief, we suggest you contact our sales staff for the answer to your particular problem, if you do not find a standard combination on the next pages.

## 1. Thyatron Controllers

CX25 handles up to 1/4 H.P. 2T60 handles up to 1/50 H.P.

Tried and true. Back E.M.F. speed correction about 8%. Correction better at lower speeds than high. Half-wave rectification with filtering. Tube life approximately 8000 hours. Proven to be dependable. Chief disadvantage is 30 second delay required for tubes to warm up. Being replaced slowly by solid state controls. Speed range of approximately 20 to 1. Reversible.

## 2. Silicon/Autotransformer

S12 handles up to 1/8 H.P. S30 handles up to 1/3 H.P.

Rugged, simple control for continuous duty. No feedback, therefore changes in motor speed will occur as either load or input voltages change. No maintenance problem due to solid state silicon diodes. Circuit-breaker protection of armature circuit. No aging of parts. Internal ventilation not required. Solid state silicon rectifiers utilized. Speed controlled by variable transformer. Controls motor through better than 15 to 1 speed range. Reversible.

## 3. SCR Controllers—(Silicon Controlled Rectifier)

S10 handles up to 1/20 H.P. S47 handles up to 1/3 H.P. S250 handles up to 1 H.P. S800 handles up to 2 H.P.

Silicon controlled rectifier fired by unijunction transistor. All circuitry is solid state. Full wave rectification with filtering assures you of long

motor life by minimizing brush sparking and motor heating at low speeds. Zener diode reference circuit provides not only for correction of motor speeds due to fluctuating AC input voltages but also speed correction for changes in loading. Regulation is good. Smaller and lighter in weight than any other type of control. Reversible. Speed range approximately 20 to 1.

## 4. SCR Controllers with Tachometer Generator Feedback

S50T handles up to 1/3 H.P. S250T handles up to 1 H.P.

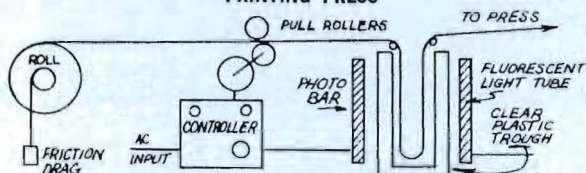
The ultimate in speed regulation. Approximately 1% control assured by Tach-Generator which signals controller if motor deviates from pre-set speed. Otherwise similar to SCR controllers described under #3. Speed range better than 25 to 1 (conservatively) can be expected.

NOTE: It is worthwhile noting that all Heller Controls are designed for operation with either 115 or 230 standard voltage DC motors. A cheaper control can be built by using odd voltage motors, however, this usually puts the prospective purchaser in a position where he doesn't have as wide a choice of motors to select from. In addition, reduced voltage motors require higher currents to produce the same power which results in lower efficiency, increased heating and shorter brush life. We have not sacrificed quality to build a cheaper control.

5. PM Controllers for PMI Printed Motors. Extremely wide ranges of speeds can be obtained by using these SCR controllers especially designed to match the low voltage PMI Printed Motors. Line voltage and load correction are standard; greater accuracy and extended speed ranges may be obtained by adding the VIS-COUNT tach-generator feedback system.

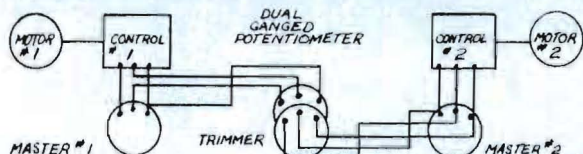
Here are a few applications of Heller motor controllers. You will note that simple circuit changes can accomplish complicated programs for automation.

## AUTOMATIC TENSIONLESS FEEDER FROM PAPER ROLL TO PRINTING PRESS



As the tape to press is pulled to press, the loop of tape hanging between light tube and photo-bar is pulled up, exposing a greater area of photo-bar to fluorescent light tube. This will increase the motor speed (proportionately) as a greater area of the photo-bar is exposed to the light tube.

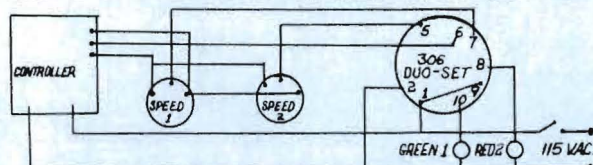
The more light falling on the photobar, the faster the motor will run. As paper is pulled from the trough the motor increases speed to replace the loop. The press does not have to pull the paper off the roll.



## SPEED CONTROL FOR 2-MOTORS

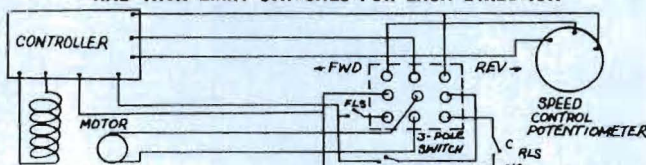
With "trimmer" tuned up to full, maximum desired speeds are set on Master #1 and Master #2. Then trimmer may be adjusted as desired and the ratio of speeds of Motor #1 to Motor #2 will remain constant. Both motors will vary up and down together. Best results with this type of system are obtained by using tachometer-generator feedback systems

## 2-SPEED OPERATION USING ATC MODEL 306 DUO-SET TIMER

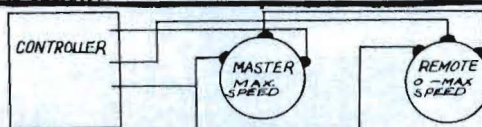


The motor will run at the speed set on control potentiometer #1 for the time set on the green pointer of the timer. Green pilot light is on. After expiration of the pre-set interval, speed changes to the speed set on control #2, green light goes out and red light comes on. This condition is maintained for the time set on the red pointer of timer. At end of this interval cycle is repeated as mentioned above.

## SLOW FORWARD, FAST REVERSE USING MANUAL REVERSING SWITCH AND WITH LIMIT SWITCHES FOR EACH DIRECTION



When reversing switch is thrown to "FWD" motor runs at speed set on control potentiometer until switch is returned to neutral or limit switch "FLS" is operated. Moving switch to "REV" position causes motor to run at full speed until switch is returned to neutral or limit switch "RLS" is operated.

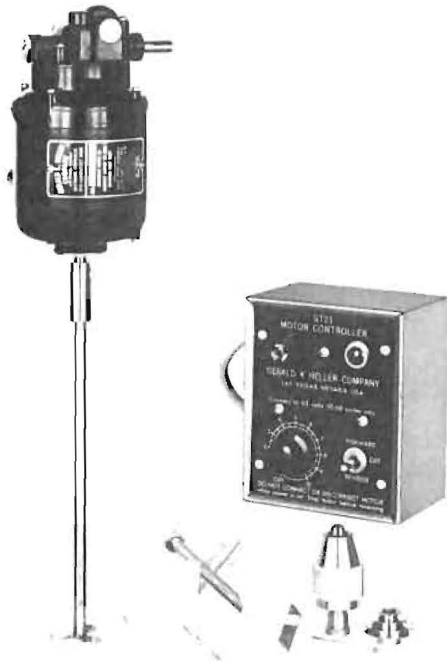


CASCADE POTENTIOMETER ARRANGEMENT—The master is set to a maximum speed; then the remote control can be adjusted to cause the motor to run at any speed from zero up to the maximum





## GT 21 UTILITY AND LAB STIRRER



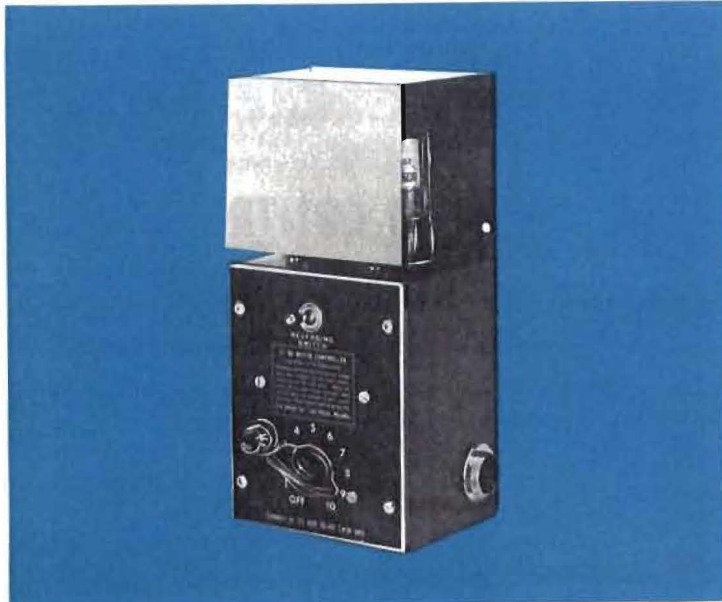
**Motor:** Quiet running, special series wound motor, enclosed, ball bearing, 1/40th horsepower, 0-6000 rpm armature shaft speed, right angle gear shaft speed 0-333 rpm at 6" lbs. torque, reversible. With regular motor base and support stand mounting bracket with 1/2" rod, 5 ft. vinyl jacketed cable with attachment plug Jones P304CCT. Both motor shafts are 5/16" diameter with milled flats.

**Controller:** Solid state type on printed circuit board, mounted on an aluminum panel, enclosed in a steel box 4" wide x 5" high x 3" deep finished with silver hammertone enamel. Line cord gray vinyl 6' long with standard grounding plug. The GT21 controller circuit corrects for line voltage variation from 95 to 145 volts A.C., that is, if the input line voltage varies from 95 to 145 the motor speed does not change. The motor regulation (from no load to full load) is about 10%. No warm-up time is required—motor will operate when switch is actuated and the motor may be started at any pre-selected speed setting, in either forward or reverse rotation. The front panel also has a pilot light to show that the line voltage is on.

**Attachments supplied:** Motor mounting bracket with 1/2" x 8" aluminum rod, regular motor mounting base made of pressed steel, chuck with adjustment from 0 to 3/8" mounted on arbor that fits either shaft, one 8" stainless steel shaft with coupling to fit shaft and 1 1/2" diameter three-bladed propeller, one stainless steel shaft same as above except with 2 1/2" paddle for use on gear shaft to stir heavy paste, polishes, etc., and one three-step brass nickel plated pulley to fit either shaft. Net weight of motor 5 pounds, controller 4 pounds, and attachments 1 pound. Shipping weight complete 12 pounds. Packed one to a carton. List price of complete motor, controller and attachments \$90.00.

## 2T - 60 MOTOR CONTROLLER

### THYRATRON TYPE FOR MOTORS UP TO 1/50 H.P.



**Rating:** Infinitely Variable Speed Control — for DC motors up to 1/50 H.P. from 115 Volt AC—50/60 cycle lines.

**Speed Range:** Automatic Field Control Rectifier — allows operation of armature at speeds up to 4000 RPM.

**Specifications:** Reversible—by means of reversing switch on front panel. Motor is off when potentiometer, is turned full left. Controller consists of two Thyatron tubes set up as half wave rectifiers. Standard NEMA three-pin grounded plug and six feet line cord. Mounting holes in back plate. Motor stop switch connected to control knob. Motor plugs into controller with locking-type connector. Motor comes complete with five feet of cable and Amphenol connector. Line fuse protects control overload by motor. Self regulating circuit supplies more armature voltage to motor to assist motor maintain speed. Full torque available over speed range listed. Silver hammertone steel cabinet with canopy to protect tubes, overall size 9" x 4" x 3 1/2". Net weight 2 lbs.

Price: For Control Only . . . \$40.00.

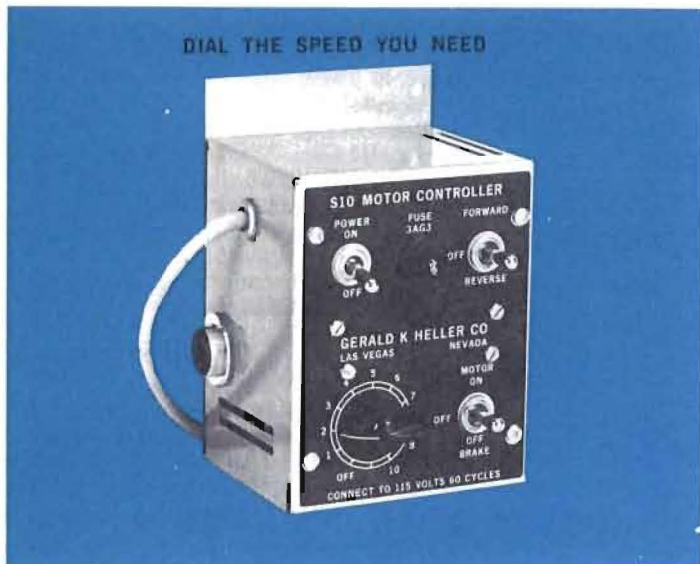
HP	SPEED RANGE	TORQUE	TYPE	CAT. NO.	PRICE motor and control
1/50	200-4000	12"OZ.	N-12	2T60-1	\$77.00
1/50	30-666	2.2"LBS	N-12R	2T60-06	\$87.00
1/50	20-400	4.0"LBS.	N-12R	2T60-10	\$87.00
1/50	10-200	5.4"LBS.	N-12R	2T60-18	\$87.00
1/50	6-133	4.0"LBS.	N-12R	2T60-30	\$87.00
1/50	5-100	7.0"LBS.	N-12R	2T60-36	\$87.00
1/50	3-66	8.0"LBS.	N-12R	2T60-60	\$87.00
1/50	2-40	5.6"LBS.	N-12R	2T60-100	\$87.00
1/50	6-13	6.1"LBS.	N-12R	2T60-300	\$87.00
1/50	35-7.5	5.0"LBS.	N-12R	2T60-540	\$87.00
1/50	2-4.5	3.5"LBS.	N-12R	2T60-900	\$87.00
1/50	16-3.5	2.2"LBS	N-12R	2T60-1110	\$87.00



# S - 10 MOTOR CONTROLLER

## SCR / POTENTIOMETER

### FOR MOTORS UP TO 1/20 H.P.



**Rating:** Single phase, 115 volt, 50/60 cycles input, for use with 115 volt DC motors up to 1/20 H.P., or series wound AC-DC motors up to .6 amperes.

**Speed Range:** Infinitely variable through speed ranges mentioned on table below. Full torque is available throughout the entire range.

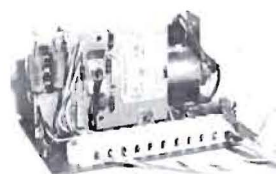
**Specifications:** The S10 is a solid state silicon motor control using a silicon controlled rectifier. Constant field voltage and variable armature voltage are supplied to the motor by a silicon diode bridge rectifier. A transistor self regulating circuit and full wave filtered rectification assure dependable, trouble-free motor service. A female Amphenol connector is at the side of the control. All motors are supplied with 5 feet of vinyl covered cable attached to a mating male Amphenol locking connector. You do no wiring. The line cord is grey vinyl six feet long with grounding plug.

**Features:** Dynamic braking and reversing are accomplished by the three position switches on front of cabinet. The motor may be started and stopped with the same speed setting and may be stopped with or without dynamic braking. Do not use the power on/off switch for starting and stopping motor. The S10 is built into an attractive steel hammer-tone box which measures 4" x 5" x 3 1/2" deep and weighs 2 pounds. The front panel is etched black aluminum. Two holes are located on back panel for ease of mounting.

**Price:** Control Only \$48.00.

#### MOTORS FOR USE WITH S-10 CONTROLLER

HP	BASE SPEED	SPEED RANGE	TORQUE	TYPE	CAT. NO.	PRICE
1/20	7500	750-11,000	16"OZ.	NSE-11	B2190C	\$35.00
1/20	3200	200-3800	6.7"OZ.	N-13	6576C	\$39.00
1/20	1725	150-2400	28"OZ.	N-33	B2408C	\$48.00
1/20	1125	150-1500	42"OZ.	N-53	B2368C	\$57.00
1/20	690	69-1050	3"LBS.	N-33R	B2408XC-2 1/2	\$106.30
1/20	345	30-470	5.5"LBS.	N-33R	B2408XC-05	\$106.30
1/20	173	15-240	11.9"LBS.	N-33R	B2408C-10	\$72.00
1/20	86	7-120	18.3"LBS.	N-33R	B2408C-20	\$72.00
1/20	57	4.5-80	21"LBS.	N-33R	B2408C-30	\$72.00
1/20	43	3.5-60	20"LBS.	N-33R	B2408C-40	\$72.00
1/20	29	2.5-40	13"LBS.	N-33R	B2408XC-60	\$76.90
1/50	690	69-1050	1.2"LBS.	N-12RH	B2150C-2-1/H	\$91.36
1/50	345	34-525	2.4"LBS.	N-12RH	B2150C-2-1/2H	\$91.36
1/50	173	11.7-270	4.8"LBS.	N-12RH	B2150C-10H	\$57.00
1/50	86	8.6-134	7.3"LBS.	N-12RH	B2150C-20H	\$57.00
1/50	57	5.7-86	8.8"LBS.	N-12RH	B2150C-30H	\$57.00
1/50	43	4.3-65	11.7"LBS.	N-12RH	B2150C-40H	\$57.00
1/50	29	2.9-45	13"LBS.	N-12RH	B2150C-60H	\$57.00
1/50	29	2.9-45	20"LBS.	N-12RG	B2150C-60G	\$65.00
1/50	19	1.9-28.5	26"LBS.	N-12RG	B2150C-90G	\$65.00
1/50	14	1.4-21	32"LBS.	N-12RG	B2150C-120G	\$65.00
1/50	7.2	.72-10.8	47"LBS.	N-12RG	B2150C-240G	\$65.00
1/70	2850	285-4275	4.8"OZ.	N-12	BL2850C	37.00
1/70	288	28-432	2.2"OZ.	N-12R	B2150EC-06	53.00
1/70	96	9.6-144	5.4"LBS.	N-12R	B2150EC-18	53.00
1/70	58	5.8-87	3.5"LBS.	N-12R	B2150EC-30	53.00
1/70	48	4.8-72	7.1"LBS.	N-12R	B2150EC-36	53.00
1/70	17	1.7-25.5	5.6"LBS.	N-12R	B2150EC-100	53.00
1/70	9.6	.96-14.4	7"LBS.	N-12R	B2150EC-180	53.00
1/70	5.8	.58-8.7	6.6"LBS.	N-12R	B2150EC-300	53.00
1/70	4	.4-6	5.7"LBS.	N-12R	B2150EC-432	53.00
1/70	1.6	.16-2.4	2.2"LBS.	N-12R	B2150EC-1120	53.00
1/70	3.6	.36-5.4	52"LBS.	N-12RG	B7052C-480G	67.00
1/100	3000	300-4500	4"OZ.	N-13	E-7-1C	30.00
1/150	1.6	.16-2.4	40"LBS.	N-12RG	B7096C-1080G	67.00



SX 10-11

OPEN CHASSIS MODELS



SX 10-RB

## SX10 - 11 CONTROLLER

USE ANY MOTOR ON S-12 TABLE

This Motor Controller is similar to the S10 but can be used for motors up to 1/8 H.P. It is mounted on a 4" x 6" x 4" steel plate that has 4 mounting holes. Terminal strip connections exist for motor AC Input and potentiometer connections. The potentiometer is furnished loose for customer mounting. Pilot light, reversing, on/off, and dynamic braking switches can be added by the user according to requirements. Line fusing is provided.

**Price:** Controller Only \$45.00.

## SX - 10 - RB CONTROLLER

The SX10RB Motor Controller is similar to the SX10-11, except that it can be used for motors up to 1/50 H.P. The SX10RB also contains relays for reversing, dynamic braking, automatic traversing, push button control, and foot control. The controller also has two potentiometers, furnished loose, for providing different pre-set speeds for forward and reverse. Line fusing is provided. Terminal strip provides easy connection for AC Input, motor and potentiometer as well as for all the possible sequences customer selects.

**10" L x 4-5/16" W x 3-1/4" D**

**Price:** Controller Only \$80.00



# S-12 MOTOR CONTROL SILICON / AUTOTRANSFORMER FOR MOTORS UP TO 1/8 H.P.



**Rating:** The S-12 Heller Control will operate shunt or compound-wound, standard voltage DC motors up to 1/8 H.P.; or series wound AC-DC motors up to 1.5 amperes. Speeds are dialed by turning a knob on the front panel of control.

**Speed Range:** Infinitely variable from approximately 10% of motor speed to 30% above motor speed. A range of 20 to 1 is available at the low setting with full torque ratings. When the hi-lo switch is set at high, a 25 to 1 speed range is obtained with a slight decrease in available torque.

**Specifications:** A solid-state, silicon bridge rectifier, varied by an adjustable transformer, controls the armature of the motor. The field is supplied with 115 volts DC through a silicon bridge rectifier. At the high speed setting, a resistor is put in series with the field, which allows for a speed increase of approximately 30% above the top speed indicated.

The input to the control is 115 Volt, AC, 50/60 cycles. A three prong grounding plug and 6 feet of cord are supplied. The output is a Cinch Jones female plug at the back of control. Any motor supplied will have six feet of vinyl cable and a male plug to fit. You do no wiring. Reversing is accomplished by means of three position switch with center off. No warm-up time is required. The Armature circuit is protected by thermal circuit breaker. Pilot light, power on/off switch and main line fuse are provided. The S-12 control is furnished in steel cabinet with bright silver hammertone finish. Cabinet size is 6 1/2" wide, 4" high, 3" deep. Total weight is only 4 1/2 pounds.

PRICE CONTROLLER ONLY \$ 52.00

HP	BASE SPEED	SPEED RANGE	TORQUE	TYPE	CAT. NO.	PRICE
1/8	1725	150-2400	70"OZ.	N-54	B2420C	\$55.00
1/8	1725	150-2600	70"OZ.	55	65118C	\$34.00
1/8	860	80-1200	146"OZ.	RE-316	RE-316-6	\$90.00
1/8	690	60-900	8"LBS.	N-54RL	B2420XC-2 1/2 L	\$127.95
• 1/8	500	50-700	10"LBS.	NSE-34RH	B5260C-10H	\$67.80
1/8	345	30-450	16"LBS.	N-54RL	B2420C-05L	\$120.43
• 1/8	250	25-350	19"LBS.	NSE-34RH	B5260C-20H	\$67.80
1/8	173	15-240	32"LBS.	N-54RL	B2420C-10L	\$85.00
• 1/8	125	12-175	28.4"LBS.	NSE-34RH	B5260C-40H	\$67.80
1/8	86	7-120	54"LBS.	N-54RL	B2420C-20L	\$85.00
1/8	57	4.5-80	66"LBS.	N-54RL	B2420C-30L	\$85.00
1/8	43	3.5-60	77"LBS.	N-54RL	B2420C-40L	\$85.00
• 1/10	10,000	1000-15,000	10"OZ.	NSE-12	B2208C	\$35.90
• 1/10	500	50-700	8.2"LBS.	NSE-33R	B5258C-10	\$61.70
• 1/10	333	33-450	10.4"LBS.	NSE-33R	B5258C-15	\$61.70
• 1/10	250	25-350	12.5"LBS.	NSE-33R	B5258C-20	\$61.70
1/12	1725	150-2400	48"OZ.	N-53	B2418C	\$51.00
1/12	1725	150-2400	48"OZ.	N-34	6591	\$36.00
1/12	1125	100-1500	70"OZ.	N-54	B2370C	\$63.00
1/12	690	60-900	5.5"LBS.	N-53R	B2418XC-2 1/2	\$121.54
1/12	345	30-450	11"LBS.	N-53R	B2418XC-05	\$106.54
1/12	173	15-240	21"LBS.	N-53R	B2418C-10	\$80.00
1/12	86	7-120	37"LBS.	N-53R	B2418C-20	\$80.00
1/12	43	3.5-60	55"LBS.	N-53R	B2418C-40	\$80.00
1/15	10,000	1000-15,000	7"OZ.	NSE-11	B2206C	\$35.00
1/15	1725	150-2400	37"OZ.	N-34	B2410C	\$49.00
1/15	690	60-900	4.3"LBS.	N-34RH	B2410XC-2 1/2 H	\$116.48
1/15	345	30-450	8.5"LBS.	N-34RH	B2410XC-05H	\$106.48
1/15	172	15-2400	17"LBS.	N-34RH	B2410C-10H	\$75.00
1/15	86	7-120	29"LBS.	N-34RH	B2410C-20H	\$75.00
1/15	57	4.5-80	37"LBS.	N-34RH	B2410C-30H	\$75.00
1/15	43	3.5-60	44"LBS.	N-34RH	B2410C-40H	\$75.00
1/15	24	2-33	88"LBS.	N-34RJ	B2410C-72J	\$125.00
1/15	12	1-16.5	140"LBS.	N-34RJ	B2410C-144J	\$125.00
1/15	5.7	.5-8	219"LBS.	N-34RJ	B2410C-300J	\$125.00
1/16	5000	500-7000	13"OZ.	NSE-13	B2172C	\$43.00
1/18	500	50-100	4.5"LBS.	NSE-12RH	B2170C-10H	\$52.65
1/18	250	25-350	7"LBS.	NSE-12RH	B2170C-20H	\$52.65
1/18	125	12-175	11.2"LBS.	NSE-12RH	B2170C-40H	\$52.65
1/20	7500	750-11,000	16"OZ.	NSE-11	B2190C	\$35.00
1/20	3200	200-3800	6.7"OZ.	N-13	6576C	\$39.00
1/20	1725	150-2400	28"OZ.	N-33	B2408C	\$48.00
1/20	1125	150-1500	42"OZ.	N-53	B23E8C	\$57.00
1/20	690	60-1050	3"LBS.	N-33R	B2408XC-2 1/2	\$106.30
1/20	345	30-470	5.5"LBS.	N-33R	B2408XC-05	\$106.30
1/20	173	15-240	11.9"LBS.	N-33R	B2408C-10	\$72.00
1/20	86	7-120	18.3"LBS.	N-33R	B2408C-20	\$72.00
1/20	57	4.5-80	21"LBS.	N-33R	B2408C-30	\$72.00
1/20	43	3.5-60	20"LBS.	N-33R	B2408C-40	\$72.00
1/20	29	2.5-40	13"LBS.	N-33R	B2408XC-60	\$76.90
1/50	690	60-1050	1.2"LBS.	N-12RH	B2150C-2-1/H	\$91.36
1/50	345	34-525	2.4"LBS.	N-12RH	B2150C-2-1/2H	\$91.36
1/50	173	11.7-270	4.8"LBS.	N-12RH	B2150C-10H	\$57.00
1/50	86	8.6-134	7.3"LBS.	N-12RH	B2150C-20H	\$57.00
1/50	57	5.7-86	8.8"LBS.	N-12RH	B2150C-30H	\$57.00
1/50	43	4.3-65	11.7"LBS.	N-12RH	B2150C-40H	\$57.00
1/50	29	2.9-45	13"LBS.	N-12RH	B2150C-60H	\$57.00
1/50	29	2.9-45	20"LBS.	N-12RG	B2150C-60G	\$65.00
1/50	19	1.9-28.5	26"LBS.	N-12RG	B2150C-90G	\$65.00
1/50	14	1.4-21	32"LBS.	N-12RG	B2150C-120G	\$65.00
1/50	7.2	.72-10.8	47"LBS.	N-12RG	B2150C-240G	\$65.00
1/70	2850	285-4275	4.8"OZ.	N-12	BL2850C	37.00
1/70	288	28-432	2.2"OZ.	N-12R	B2150EC-06	53.00
1/70	96	9.6-144	5.4"LBS.	N-12R	B2150EC-18	53.00
1/70	58	5.8-87	3.5"LBS.	N-12R	B2150EC-30	53.00
1/70	48	4.8-72	7.1"LBS.	N-12R	B2150EC-36	53.00
1/70	17	1.7-25.5	5.6"LBS.	N-12R	B2150EC-100	53.00
1/70	9.6	.96-14.4	7"LBS.	N-12R	B2150EC-180	53.00
1/70	5.8	.58-8.7	6.6"LBS.	N-12R	B2150EC-300	53.00
1/70	4	.4-6	5.7"LBS.	N-12R	B2150EC-432	53.00
1/70	1.6	.16-2.4	2.2"LBS.	N-12R	B2150EC-1120	53.00
1/70	3.6	36-5.4	52"LBS.	N-12RG	B7052C-480G	67.00
1/100	3000	300-4500	4"OZ.	N-13	E-7-1C	30.00
1/150	1.6	.16-2.4	40"LBS.	N-12RG	B7096C-1080G	67.00





## CX 25 CONTROLLER

### THYRATRON TYPE

#### FOR MOTORS UP TO 1/4 H.P.

**Rating:** This controller operates motors up to 1/4 H.P. 115V D.C. and is powered from 115 volts AC through a standard NEMA three-pin grounding plug.

**Speed Range:** Both coarse and fine speed adjustments are provided, the fine adjustment giving about 10% variation about the point set on the coarse adjustment. In addition, an acceleration control allows the rate of buildup to the preset speed to be varied from zero to 20 seconds. This is most useful for winding applications.

**Specifications:** A three-position switch gives forward-stop-reverse operation and a brake switch controls the dynamic braking circuit which will stop the motor quickly if desired. Other standard equipment includes a line switch and fuse, pilot light, carrying handle and four-pin motor connector.

This unit uses the patented Heller self-correcting speed control circuit and includes a time delay to allow for proper tube warmup when the unit is first turned on.

It is contained in a steel cabinet 9" high x 7" wide x 7" high. You dial the speed you need. **PRICE CONTROLLER ONLY \$144.00**

## S-30 CONTROLLER

### SILICON / AUTOTRANSFORMER

#### FOR MOTORS UP TO 1/3 H.P.

**Rating:** The S30 controller will operate 115V D.C. motors up to 1/3 H.P. from 115 volt AC lines.

**Speed Range:** Solid State Controller permits you to dial the speed you need with full torque over the entire speed range of 15 to 1.

**Specifications:** Conveniently mounted on the panel are a three position forward-stop-reverse switch and speed control knob. A special circuit allows the reversing switch to be thrown from forward to reverse without damaging the motor, as dynamic braking will be applied automatically during the reversal. Standard equipment for the S30 includes: line switch, fuse, carrying handle pilot light and motor circuit breaker, which will open if motor current exceeds 5 amperes for 15 seconds. A four pin connector is used. No warmup time is required due to solid state circuitry. The S30 is housed in a steel cabinet 9" high x 7" wide x 7" deep and is furnished complete with a standard NEMA three pin grounding plug and line cord.

**PRICE CONTROLLER ONLY \$126.00**

#### MOTORS FOR USE WITH CX25 AND S-30 CONTROLLERS

HP	BASE SPEED	SPEED RANGE	TORQUE	TYPE	CAT. NO.	PRICE
1/3	5000	500-6000	67"OZ.	RE-316	RE-316-3	\$115.00
1/3TE	3450	300-4000	5"LB	56	64440C	\$95.00
1/3XP	1725	150-2000	11.5"LB	H56	65239C	\$130.00
1/3	1725	150-2000	11.5"LB	56	65241C	\$85.00
1/3TE	1725	150-2000	11.5"LB	H56	65238-1-C	\$95.00
1/3TE	1140	100-1300	17"LB	56	65228AC	\$105.00
1/3XP	420	30-460	47"LB	H56SP	65219-1C	\$185.00
1/3TE	420	30-460	47"LB	H56SP	65219C	\$159.00
1/3	420	30-460	47"LB	H56SP	65218AC	\$164.00
1/3TE	190	14-210	103"LB	H56DP	65215-1-C	\$176.00
1/3TE	173	15-200	89"LB	G56RW	65314C	\$165.00
1/3XP	86	7-100	154"LB	H56RW	65211-1-C	\$189.00
1/3	72	7-80	172"LB	G56RW	65207-1-C	\$165.00
1/3	600	70-660	34.5"LB	66	65219-2-C	\$105.00
1/4	7500	750-8250	33"OZ.	RE-316	RE-316-4	\$135.00
1/4	3450	300-4000	69"OZ.	RE-316	65199C	\$70.00
1/4TE	3450	300-4000	69"OZ.	RE-316	65199-1-C	\$80.00
1/4	1725	150-2000	139"OZ.	N55	B24222C	\$75.00
1/4TE	1725	150-2000	139"OZ.	H66	65184-1-C	\$83.00
1/4TE	1125	100-1300	26.2"LB	56	65182C	\$95.00
1/4TE	780	70-860	19"LB	G56SP	65182-1-C	\$147.00
1/4TE	420	30-460	35"LB	G56SP	65171C	\$157.00
1/4	420	30-460	35"LB	G56SP	65168C	\$172.00
1/4TE	190	14-210	78"LB	G56DP	65166-1-C	\$166.00
1/4	173	15-200	75"LB	N-55RH	B24222C-10H	\$132.00
1/4	96	8-106	115"LB	N-55RH	B24222C-18H	\$132.00
1/4	72	7-80	177"LB	N-55RH	B24222C-24H	\$132.00
1/4	36	3-40	254"LB	N-55RH	B24222C-48H	\$132.00
1/4TE	17	1.5-19	588"LB	DS13	65168-1-C	\$160.00
1/4XP	420	30-460	35"LB	G56SP	65152C	\$175.00
1/4TE	13.5	1-15	536"LB	G56RC	65151-1-C	\$172.00
1/6	3450	300-3800	46"OZ.	RE-316	65199-2-C	\$64.00
1/6TE	1725	150-2000	93"OZ.	56	65149C	\$62.00
1/6	1140	100-1300	140"OZ.	RE-316	RE-316-5	\$80.00
• 1/7	10,000	1000-11,000	14.6"OZ.	NSE-13	B2110C	\$37.50
1/8	1725	150-2000	70"OZ.	N54	B2420C	\$55.00
1/8	1725	150-2000	70"OZ.	55	65118C	\$34.00
1/8	860	80-1000	146"OZ.	RE-316	RE-316-6	\$90.00
1/8	690	60-760	8"LB	N-54RL	B2420XC-2 1/2 L	\$127.95
• 1/8	500	50-550	10"LB	NSE-34RH	B5260C-10H	\$67.80
1/8	345	30-390	16"LB	N-54RL	B2420C-05L	\$120.43
• 1/8	250	25-275	19"LB	NSE-34RH	B5260C-20H	\$67.80
1/8	173	15-200	32"LB	N-54RL	B2420C-10L	\$85.00
• 1/8	125	12-137	28.4"LB	NSE-34RH	B5260C-40H	\$67.80
1/8	86	7-1000	54"LB	N-54RL	B2420C-20L	\$85.00
1/8	57	4.5-66	66"LB	N-54RL	B2420C-30L	\$85.00
1/8	43	3.5-50	77"LB	N-54RL	B2420C-40L	\$85.00

\*These motors are series wound and are normally supplied in one direction of rotation only normally clockwise viewing shaft



# S - 47 MOTOR CONTROLLER

## SCR / POTENTIOMETER FOR MOTORS UP TO 1/3 H.P.



**Rating:** Infinitely Variable Speed Control for motors up to 1/3 H.P. 115V D.C. from 115 volt, A.C. lines.

**Specifications:** Solid State Silicon controlled rectifier solid state circuitry requires no warmup time. A Zener diode circuit controls a transistor which corrects speed for load changes and line voltage fluctuations. Full Rated Torque available over the entire speed range. Full Wave Filtered Rectification. Constant field voltage and variable armature voltage is supplied to motor by a silicon diode bridge rectifier, a silicon controlled rectifier and a transistor circuit which is self-correcting. The filter smooths the armature current minimizing motor heating and brush sparking. Reversible by means of three position toggle reversing switch. Dynamic braking is applied to the motor in the off position. Motor plugs into controller—no wiring needed... Operates on 115 volts, 50-60 cycles.

Three position switch (forward, Off, Reverse). Power ON-OFF switch... Standard NEMA 3-pin grounded plug and 6 foot cord. Pilot light... Line fuse... Motor fuse. **Speed Range:** Speed adjustments Dial permits speed to be adjusted over 20 to 1 speed range with no jumping and with stability. Extended Speed Range: Hi-Lo range switch lowers the field voltage to give higher speeds at reduced torque.

**PRICE CONTROLLER ONLY \$126.00**



Foot operated speed control. Heavy duty model. This controller can operate the S47, S10, SX10-11 and SX10RB motor controllers. Price wired to controller \$65.00.

**THE MOTOR LISTING FOR THE S-47  
MOTOR CONTROLLER WILL BE FOUND  
ON THE FOLLOWING PAGE**



### MOTORS FOR S47 AND S50T CONTROLLERS

HP	S50T	S47	TORQUE	TYPE	CAT. NO.	PRICE	HP	S50T	S47	TORQUE	TYPE	CAT. NO.	PRICE
	SPEED RANGE	SPEED RANGE						SPEED RANGE	SPEED RANGE				
• 1/3	350-7000	500-7000	67" LBS.	RE-316	R-316-3	\$160.00	1/12	40-900	60-900	5.5" LBS.	N-53R	B2418XC-2 1/2	\$121.54
1/3TE	210-4400	300-4400	5" LBS.	56	64440C	\$95.00	1/12	20-450	30-450	11" LBS.	N-53R	B2418XC-05	\$106.54
1/3XP	105-2400	150-2400	11.5" LBS.	H56	65239C	\$130.00	1/12	11-240	15-240	21" LBS.	N-53R	B2418C-10	\$80.00
1/3	105-2600	150-2400	11.5" LBS.	H56	65241C	\$80.00	1/12	5-120	7-120	37" LBS.	N-53R	B2418C-20	\$80.00
1/3TE	105-2400	150-2400	11.5" LBS.	56	65238-1C	\$95.00	1/12	2.5-60	3.5-60	55" LBS.	N-53R	B2418C-40	\$80.00
1/3TE	70-1500	100-1500	17" LBS.	J56	65228AC	\$105.00	• 1/15	750-15,000	1000-15,000	7" OZ.	NSE-11	B2206C	\$35.00
1/3XP	21-500	30-500	47" LBS.	H56SP	65219-1C	\$185.00	1/15	105-2400	150-2400	37" OZ.	N-34	B2410C	\$49.00
1/3TE	21-500	30-500	47" LBS.	H56SP	65219C	\$164.00	1/15	40-900	60-900	4.3" LBS.	N-34RH	B2410XC-2 1/2 H	\$116.48
1/3	21-500	30-500	47" LBS.	H56SP	65218AC	\$159.00	1/5	20-450	30-450	8.5" LBS.	N-34RH	B2410XC-05H	\$106.48
1/3TE	9.5-230	14-230	103" LBS.	H56DP	65215-1C	\$195.00	1/15	11-240	15-2400	17" LBS.	N-34RH	B2410C-10H	\$75.00
1/3TE	11-240	15-240	89" LBS.	G56RW	65314C	\$175.00	1/15	5-120	7-120	29" LBS.	N-34RH	B2410C-20H	\$75.00
1/3XP	5-120	7-120	154" LBS.	H56RW	65211-1C	\$194.00	1/15	3.1-80	4.5-80	37" LBS.	N-34RH	B2410C-30H	\$75.00
1/3TE	4.9-100	7-100	172" LBS.	G56RW	65207-1C	\$175.00	1/15	2.5-60	3.5-60	44" LBS.	N-34RH	B2410C-40H	\$75.00
1/3	50-800	70-800	34.5" LBS.	66	65219-2C	\$115.00	1/15	1.4-33	2-33	88" LBS.	N-34RJ	B2410C-72J	\$125.00
							1/15	7-16.5	1-16.5	140" LBS.	N-34RJ	B2410C-144J	\$125.00
							1/15	35-8	5-8	219" LBS.	N-34RJ	B2410C-300J	\$125.00
• 1/4	400-8500	750-8500	33" OZ.	RE-316	RE-316-4	\$145.00	• 1/16	350-7000	500-7000	13" OZ.	NSE-13	B2172C	\$43.00
1/4	210-4200	300-4200	69" OZ.	RE-316	65199C	\$70.00	• 1/18	30-100	50-100	4.5" LBS.	NSE-12RH	B2170C-10H	\$52.65
1/4TE	210-4200	300-4200	69" OZ.	RE-316	65199-1C	\$80.00	• 1/18	18-350	25-350	7" LBS.	NSE-12RH	B2170C-20H	\$52.65
1/4	105-2400	150-2400	139" OZ.	N55	B24222C	\$70.00	• 1/18	9-175	12-175	11.2" LBS.	NSE-12RH	B2170C-40H	\$52.65
1/4 XP	105-2400	150-2400	139" OZ.	G56	65184-1C	\$170.00							
1/4TE	105-2400	150-2400	139" OZ.	H66	65184-1C	\$85.00	• 1/20	750-10,000	750-11,000	16" OZ.	NSE-11	B2190C	\$35.00
1/4TE	70-1500	100-1500	26.2" LBS.	56	65182C	\$95.00	1/20	140-3800	200-3800	6.7" OZ.	N-13	6576C	\$39.00
1/4TE	55-1100	70-1100	19" LBS.	G56SP	65182-1C	\$147.00	1/20	105-2400	150-2400	28" OZ.	N-33	B2408C	\$48.00
1/4TE	21-500	30-500	35" LBS.	G56SP	65171C	\$167.00	1/20	105-1500	150-1500	42" OZ.	N-53	B2368C	\$57.00
1/4XP	21-500	30-500	35" LBS.	G56SP	65168-1C	\$175.00	1/20	40-800	69-1050	3" LBS.	N-33R	B2408XC-2 1/2	\$106.30
1/4	21-500	30-500	35" LBS.	G56SP	65168C	\$157.00	1/20	21-470	30-470	5.5" LBS.	N-33R	B2408XC-05	\$106.30
1/4TE	9.5-23	14-230	78" LBS.	G56DP	65166-1C	\$175.00	1/20	11-240	15-240	11.9" LBS.	N-33R	B2408C-10	\$72.00
1/4	11-240	15-240	75" LBS.	N-55RH	B24222C-10H	\$127.00	1/20	4.9-120	7-120	18.3" LBS.	N-33R	B2408C-20	\$72.00
1/4	5.6-133	8-133	115" LBS.	N-55RH	B24222C-18H	\$127.00	1/20	3.1-80	4.5-80	21" LBS.	N-33R	B2408C-30	\$72.00
1/4	4.9-100	7-100	177" LBS.	N-55RH	B24222C-24H	\$127.00	1/20	2.5-60	3.5-60	20" LBS.	N-33R	B2408C-40	\$72.00
1/4	2.1-50	3-50	254" LBS.	N-55RH	B24222C-48H	\$127.00	1/20	1.75-40	2.5-40	13" LBS.	N-33R	B2408XC-60	\$76.90
1/4TE	1.05-24	1.5-24	588" LBS.	DS13	65152C	\$165.00							
1/4TE	7-17	1-17	536" LBS.	G56RC	65151-1C	\$188.00							
1/6	210-4200	300-4200	46" OZ.	RE-316	65199-2C	\$64.00	1/50	690	69-1050	1.2" LBS.	N-12RH	B2150C-2-1/H	\$91.36
1/6TE	105-2400	150-2400	93" OZ.	56	65149C	\$62.00	1/50	345	34-525	2.4" LBS.	N-12RH	B2150C-2-1/2H	\$91.36
1/6	75-1500	100-1500	140" OZ.	RE-316	RE-316-5	\$80.00	1/50	173	11.7-270	4.8" LBS.	N-12RH	B2150C-10H	\$57.00
• 1/7	750-15,000	1000-15,000	14.6" OZ.	NSE-13	B2110C	\$37.50	1/50	86	8.6-134	7.3" LBS.	N-12RH	B2150C-20H	\$57.00
							1/50	57	5.7-86	8.8" LBS.	N-12RH	B2150C-30H	\$57.00
1/8	105-2400	150-2400	70" OZ.	N-54	B2420C	\$55.00	1/50	43	4.3-65	11.7" LBS.	N-12RH	B2150C-40H	\$57.00
1/8	105-2600	150-2600	70" OZ.	55	65118C	\$34.00	1/50	29	2.9-45	13" LBS.	N-12RH	B2150C-60H	\$57.00
1/8	60-1200	80-1200	146" OZ.	RE-316	RE-316-6	\$90.00	1/50	29	2.9-45	20" LBS.	N-12RG	B2150C-60G	\$65.00
1/8	40-900	60-900	8" LBS.	N-54RL	B2420XC-2 1/2 L	\$127.95	1/50	19	1.9-28.5	26" LBS.	N-12RG	B2150C-90G	\$65.00
• 1/8	35-700	50-700	10" LBS.	NSE-34RH	B5260C-10H	\$67.80	1/50	14	1.4-21	32" LBS.	N-12RG	B2150C-120G	\$65.00
1/8	20-450	30-450	16" LBS.	N-54RL	B2420C-05L	\$120.43	1/50	7.2	7.2-10.8	47" LBS.	N-12RG	B2150C-240G	\$65.00
• 1/8	18-350	25-350	19" LBS.	NSE-34RH	B5260C-20H	\$67.80							
1/8	11-240	15-240	32" LBS.	N-54RL	B2420C-10L	\$85.00	1/70	220-4275	285-4275	4.8" oz	N-12	BL2850C	37.00
• 1/8	9-175	12-175	28.4" LBS.	NSE-34RH	B5260C-40H	\$67.80	1/70	20-432	28-432	2.2" oz.	N-12R	B2150EC-06	53.00
1/8	5-120	7-120	54" LBS.	N-54RL	B2420C-20L	\$85.00	1/70	8-144	9.6-144	5.4" lbs.	N-12R	B2150EC-18	53.00
1/8	3.1-80	4.5-80	66" LBS.	N-54RL	B2420C-30L	\$85.00	1/70	4.3-87	5.8-87	3.5" lbs.	N-12R	B2150EC-30	53.00
1/8	2.5-60	3.5-60	77" LBS.	N-54RL	B2420C-40L	\$85.00	1/70	3.4-72	4.8-72	7.1" lbs.	N-12R	B2150EC-36	53.00
							1/70	1.2-25.5	1.7-25.5	5.6" lbs.	N-12R	B2150EC-100	53.00
							1/70	8-14.4	9.6-14.4	7" lbs.	N-12R	B2150EC-180	53.00
							1/70	43-8.7	58-8.7	6.6" lbs.	N-12R	B2150EC-300	53.00
							1/70	39-6	4-6	5.7" lbs.	N-12R	B2150EC-432	53.00
							1/70	15-2.4	16-2.4	2.2" lbs.	N-12R	B2150EC-1120	53.00
							1/70	35-5.4	36-5.4	52" lbs.	N-12RG	B7052C-480G	67.00
							1/100	210-4500	300-4500	4" oz.	N-13	E-7-1C	30.00
							1/150	15-2.4	16-2.4	40" lbs.	N-12RG	B7096C-1080G	67.00

\*These motors are series wound AC-DC and are furnished in single rotation, clockwise facing shaft. Regulation of series wound motors is not as good as regulation of D.C. Shunt motors.



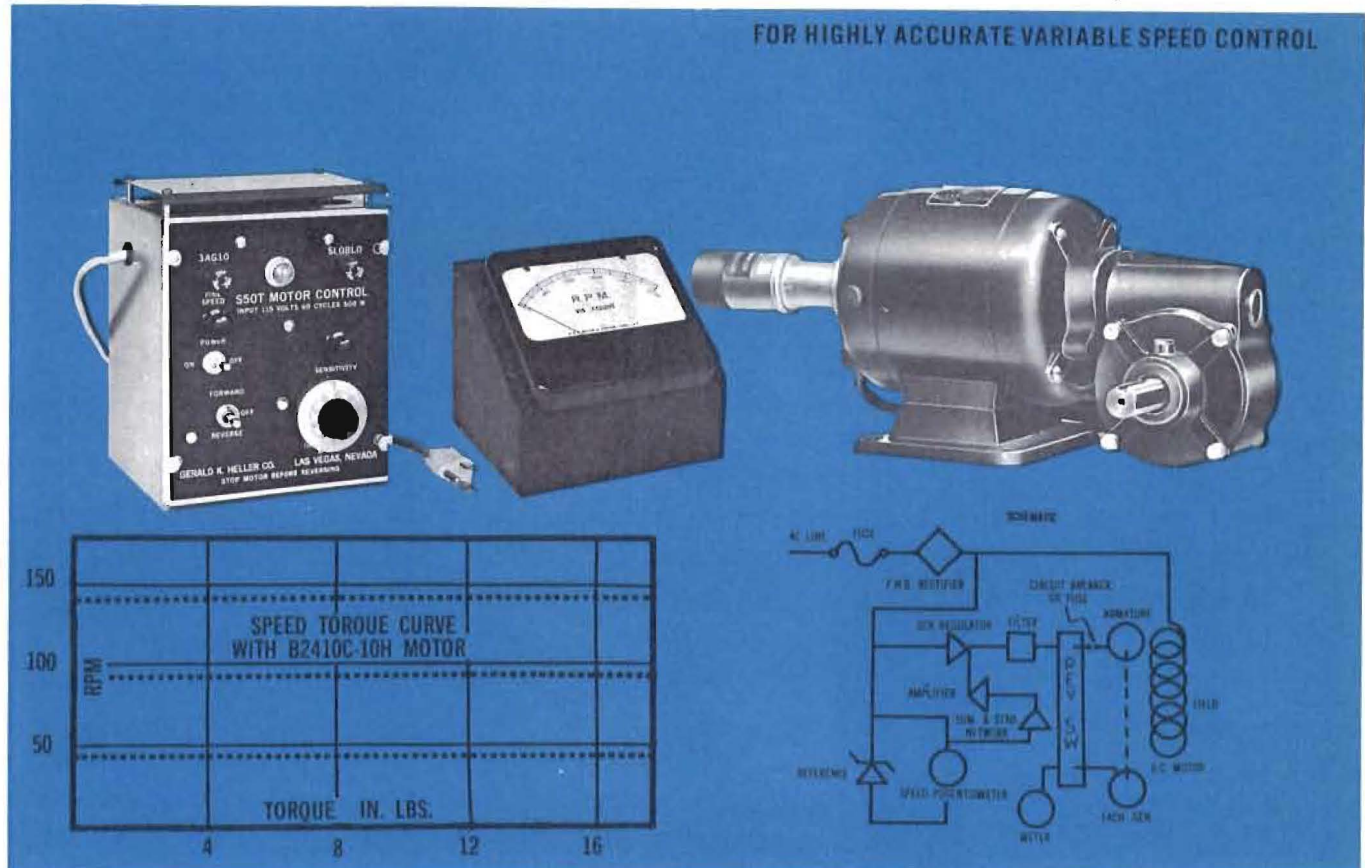
# S50T MOTOR CONTROLLER

## SCR / POTENTIOMETER

### WITH TACHOMETER FEED - BACK

FOR MOTORS UP TO 1/3 H.P.

FOR HIGHLY ACCURATE VARIABLE SPEED CONTROL



**Rating:** The S50T tachometer-generator feedback system is a closed-loop, precision system for controlling the speed of 115 volt, DC shunt motors rated up to  $1/3$  H.P., from 115 VAC.

**Speed Range:** A 25 to 1 speed range is easily obtained with  $\pm 1\%$  regulation. Full torque is available at all speeds.

**Specifications:** A transistor amplifier and stabilization circuit control the silicon controlled rectifier so that full wave filtered DC voltage is supplied to the motor armature in the amount required by the particular load in order to hold the speed at the pre-set R.P.M. The precision B&B Tachometer Generator furnishes a signal which is compared to the command signal set on the coarse and fine speed 10 turn calibrated adjusting potentiometer in the Zener Diode reference circuit. Voltage changes in the A.C. supply lines, as well as load changes, have negligible effect on the system. An accuracy of  $\pm 1\%$  is to be expected. A sensitivity control is provided to match the load characteristics to the system.

**Tachometer-Generator:** A precision tachometer-generator is used to assure accurate readings and regulation. For armature speeds up to 2000 RPM, use the M176T2. For armature speeds above 2000 RPM up to 10,000 RPM, use the M176T1. Both of these tach-generators are described in this catalog. If a gearmotor is ordered, we calibrate the indicating meter to the proper gear shaft output speed.

SEE PAGES 54 AND 55 FOR INFORMATION  
ON TACHOMETERS AND METERS

**Features:** A six-foot vinyl covered cord and a three prong grounding plug accept the AC input. The motor is connected to the control unit by means of a four conductor, vinyl covered cable with a Cinch Jones plug. The control has a female connector. In addition, 20 feet of wire is supplied for remote location of the indicating meter which is a standard  $4\frac{1}{2}$ " instrument furnished in a black wrinkle finished meter cabinet. A four pin Amphenol connector is provided for the tachometer-generator and meter leads. You do no wiring.

Reversing is provided for by means of a three-pole, center off switch. Dynamic braking is applied to the motor in the "off" position. No warmup time is required because of solid state circuitry. Pilot light and fuses for both armature circuit and AC lines are standard features. Power on/off switch is also located on front panel.

The S50T control measures  $6\frac{1}{4}$ " wide, 7" high, 5" deep. A fan cools the interior of the control. Net weight of control only is  $6\frac{1}{2}$  lbs. The steel drip proof cabinet is a gray hammertone finish with an etched aluminum front panel.

PRICE CONTROLLER ONLY \$170.00

PRICE COMPLETE SYSTEM LESS MOTOR \$336.00

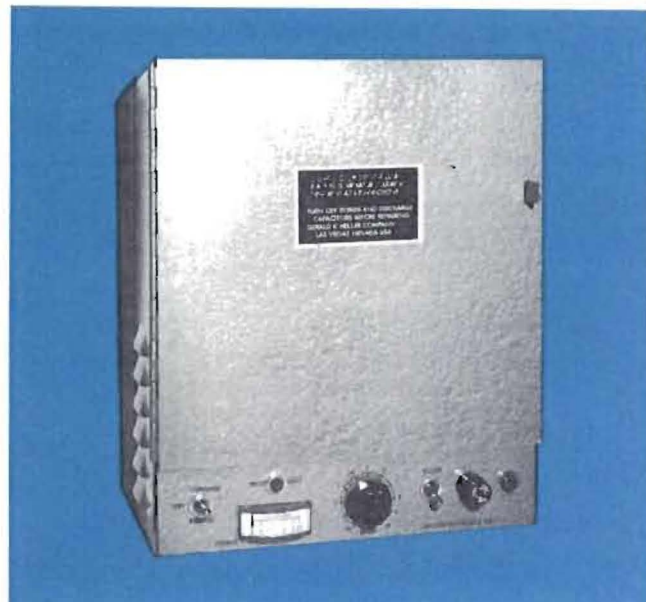


# S 250 MOTOR CONTROLLER

SCR/POTENTIOMETER

FOR MOTORS UP TO 1/2 H.P. ON 115 VAC

AND UP TO 1 H.P. ON 230 VAC



**Input:** Single phase 208/230 volt AC 50/60 cycles when motors up to 1 H.P. 230 volts DC are used, or 115 volt AC 50/60 cycles when motors up to 1/2 H.P. 115 volts DC are used. Series wound 115 volt AC-DC motors up to 4 amperes may also be used. Field output is either 200 volts or 100 volts DC according to line voltage.

**Speed Range:** Infinitely Variable from 10% to 110% of motor speed by potentiometer on front panel of control. Below 10% of base speed armature cogging may be encountered.

**Specifications:** All of the components are solid state. The armature of the motor is in series with a silicon controlled rectifier connected across a heavy silicon diode, full-wave bridge rectifier. The rectified current is filtered so that motor heating and brush sparking is minimized. The field of motor is energized by the same full-wave rectifier. The silicon controlled rectifier is pulsed by a unijunction transistor which is fired by an RC circuit. A feedback loop from the speed control fires the unijunction early if the motor is loaded giving very good speed regulation. Speed correction (regulation) of 10% or better is standard. A terminal strip with Quik-lock connections is incorporated. The motor supplied is equipped with a 6 foot vinyl covered 4-conductor cable which is color coded to the terminal strip. You do no wiring.

Reversing is accomplished by three pole switch with center position off. No warmup time is required. The controller is protected with a fuse and in addition there is also a circuit breaker in the armature circuit to protect the motor. Pilot light is furnished, as is a meter which tells at a glance the amount of current the motor is drawing. Also, there is incorporated in the circuit a slight time delay for the armature so that the field of the motor will be energized before the armature current is drawn. A main line switch is provided.

This controller is housed in a steel cabinet 10" wide x 12" high x 3 1/2" deep, enameled silver hammertone. The front cover is hinged and swings to the left of the cabinet allowing easy accessibility to components and terminal strip. Weight 10 1/2 lbs.

**PRICE CONTROLLER ONLY \$178.00**

## MOTORS FOR USE WITH S250 CONTROLLER

### FOR 115 VDC MOTORS

HP	BASE SPEED	SPEED RANGE	TORQUE	TYPE	CAT. NO.	PRICE
1/2	72	7-80	258" LBS	7418RW	65262(A)C	\$199.00
1/2	173	17-198	133" LBS	7418RW	65264(A)C	\$199.00
1/2	280	28-310	109" LBS	7418SP	65266(A)C	\$181.00
1/2	420	42-460	70" LBS	7418SP	65268C	\$160.00
1/2	860	86-1000	34" LBS	93	65272-1C	\$175.00
1/2	1750	175-2000	17" LBS	J56	65285C	\$94.00
1/2	3450	345-4000	8.7" LBS	56	65298C	\$95.00
1/3	860	86-1000	26" LBS	56	65221-1C	\$120.00

### FOR 230 VDC MOTORS

1/4	58	5.8-64	147" LBS	H56RW	65159C	\$115.00
1/3	72	7-80	172" LBS	G56RW	65208(A)C	\$163.00
1/3	173	17-200	89" LBS	G56RW	65215(A)C	\$163.00
1/3 FL MT	1750	175-2000	11.5" LBS	H56	65240C	\$69.00
1/3	1750	175-2000	11.5" LBS	H56	65241C	\$82.00
1/3	3450	345-4000	5.6" LBS	56	65252C	\$90.00
1/2	48	4-55	355" LBS	7420RW	65259(A)C	\$245.00
1/2	72	7-80	258" LBS	7418RW	65263(A)C	\$203.00
1/2	173	17-200	133" LBS	7418RW	65265(A)C	\$203.00
1/2	280	28-310	109" LBS	7418SP	65267(A)C	\$183.00
1/2	420	42-460	70" LBS	7418SP	65270(A)C	\$179.00
1/2 TE	420	42-460	70" LBS	7418SP	65269C	\$189.00
1/2 TE	780	78-858	39" LBS	7418SP	65271-1 C	\$183.00
1/2	1150	115-1300	26.2" LBS	224	65275C	\$125.00
1/2	1750	175-2000	17.5" LBS	56	65288C	\$94.00
1/2	1750	175-2000	17.5" LBS	66	65290C	\$93.00
1/2 FL MT	1750	175-2000	17.5" LBS	66	65289C	\$90.00
1/2	3450	345-4000	8.7" LBS	56	65299C	\$100.00
1/2	6000	600-7000	4.5" LBS	RE 316	RE-316-7C	\$135.00
3/4	48	4-8-53	531" LBS	7425RW	65300-1 C	\$240.00
3/4	72	7-80	492" LBS	7425RW	65304(A)C	\$240.00
3/4	125	12-140	355" LBS	7418DP	65307	\$205.00
3/4	172	17-200	199" LBS	7425RW	65309(A)C	\$230.00
3/4	420	42-460	109" LBS	7425SP	65313(A)C	\$240.00
3/4	860	86-1000	26" LBS	204	65317C	\$150.00
3/4	1140	115-1300	39" LBS	203	65320C	\$135.00
3/4	1750	175-2000	26" LBS	J56	65333C	\$102.00
3/4	1750	175-2000	26" LBS	66	65335C	\$104.00
3/4	1750	175-2000	26" LBS	203	65336C	\$110.00
3/4	1750	175-2000	26" LBS	204	65337(D)C	\$120.00
3/4	3450	300-4000	8.7" LBS	66	65341C	\$110.00
1	48	4-8-53	460" LBS	186A/W200A	65AREA 1	\$550.00
1	96	9-106	460" LBS	203RW 186A/W200A	65345C	\$550.00
1	173	17-200	280" LBS	186A/W200A	65AREA 2	\$550.00
1	420	42-460	145" LBS	186A/A010	65AREA-3	\$585.00
1	860	86-1000	68" LBS	224	65348(W)C	\$199.00
1	1150	115-1300	53" LBS	224	65350C	\$145.00
1 TESB	1750	175-2000	35" LBS	73	65360C	\$140.00
1	1750	175-2000	35" LBS	73	65316C	\$190.00
1	3450	345-4000	34" LBS	74	65364C	\$160.00

\*These motors are series wound AC DC and are furnished in single rotation, clockwise facing shaft. Regulation of series wound motors is not as good as regulation of D.C Shunt motors.

TACHOMETER GENERATOR FEEDBACK SYSTEM (AS DESCRIBED ON PAGE 61) IS ALSO AVAILABLE WITH ALL MOTORS ON THIS PAGE. PRICE ADDITION OF \$190.00 APPLIES.



# S 800 MOTOR CONTROLLER

## SCR / POTENTIOMETER

### FOR MOTORS UP TO 2 H.P.



MOTORS FOR USE WITH S800 CONTROLLER.

HP	BASE SPEED	SPEED RANGE	TORQUE	TYPE	CAT. NO.	PRICE
1-1/2	48	4.8-53	1320"LBS.	186A/W220A	65(A)C	\$650.00
1-1/2	96	9.6-106	690"LBS.	186A/W200A	65(A)C	\$610.00
1-1/2	173	17-200	427"LBS.	186A/W200A	65(A)C	\$610.00
1-1/2	420	42-460	218"LBS.	186A/AOID	65(A)C	\$650.00
1-1/2	1140	115-1300		224	65385-1-C	\$225.00
1-1/2	1725	172-2000		204	65AREA-2	\$210.00
1-1/2	3400	340-4000		203	65AREA-3	\$190.00
2	48	4.8-53	1500"LBS.	187A/W220A	65AREA-4	\$710.00
2	96	9.6-106	945"LBS.	187A/W220A	65AREA-5	\$710.00
2	173	17-200	537"LBS.	187A/W220A	65AREA-6	\$650.00
2	420	42-460	291"LBS.	187A/AOID	65AREA-7	\$730.00
2	1140	115-1300		225	65385C	\$230.00
2	1725	172-2000		224	65DYNC	\$230.00
2	3400	340-4000		204	65WURC	\$205.00

**Input:** The S800 control operates on single phase 208/230 volt, 50/60 cycles input, operating 230 volt DC motors up to 2 H.P.

**Speed Range:** Infinitely Variable from 10% to 110% of motor speed or 10 to 1 speed range by potentiometer

Below 10% of base speed armature cogging may be encountered.

**Specifications:** All of the components are solid state. The armature of the motor is in series with a silicon controlled rectifier connected across a heavy silicon diode full-wave bridge rectifier. The rectified current is filtered so that motor heating and brush sparking is minimized. The motor field is energized by the same full wave rectifier. The silicon controlled rectifier is pulsed by a unijunction transistor which is fired by an RC circuit. A feedback loop from the speed control fires the unijunction early if the motor is loaded giving very good speed regulation. Speed correction (regulation) of 10% or better is standard.

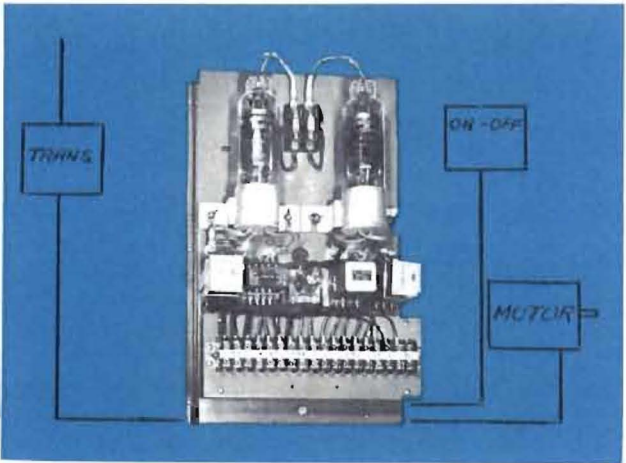
A terminal strip with Quik-lok connections is incorporated. The motor cable is color coded to the terminal strip. You do no wiring.

Reversing and dynamic braking by use of contractors is standard. No warmup time is required. The controller is protected by fuses and in addition there is also a circuit breaker in the armature circuit to protect the motor. Pilot light is furnished as is a meter which tells at a glance the amount of current the motor is drawing. Also, there is incorporated in the circuit a slight time delay for the armature so that the field of the motor will be energized before the armature current is drawn.

**Construction:** This controller is housed in a steel cabinet 14" wide x 16" high x 6" deep, enameled silver hammertone. Weight 10 1/2 lbs.

**PRICE CONTROLLER ONLY \$300.00**

TACHOMETER GENERATOR FEEDBACK SYSTEM (AS DESCRIBED ON PAGE 61) IS ALSO AVAILABLE WITH ALL MOTORS ON THIS PAGE. PRICE ADDITION OF \$190.00 APPLIES.



# THYRALINE DRIVES

## 3 TO 7 1/2 H.P.

Manufactured by the Data Master Division of The Bristol Company, the Thyra-Line variable speed drive consists of a magnetic amplifier, transistorized pre-amplifier and reference voltage unit, silicon diode field voltage supply, and a time delay. The unit is packaged in a steel cabinet with a hinged door. This is a static device which uses no vacuum tubes. Thyatron tubes are used for the armature supply.

An acceleration control is provided as standard equipment to allow the operating speed to be preset at any point. Intervals as long as 10-seconds or more from 0 to full speed may be obtained automatically.

Programmed speeds, dynamic braking and many other additional features can also be supplied.

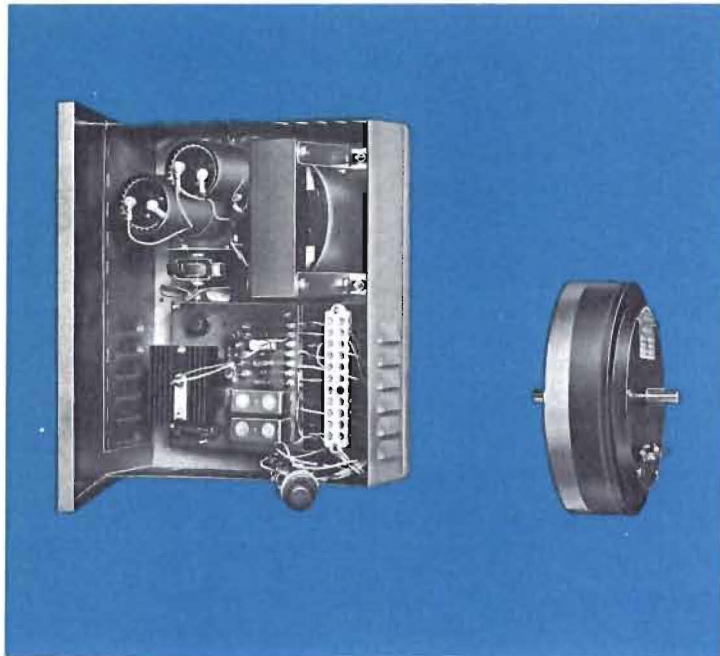
The input to the control is 208/230 Volt, AC, 1 PHASE, 60 cycle. A standard dry-type transformer is supplied.

TACHOMETER GENERATOR FEEDBACK SYSTEM (AS DESCRIBED ON PAGE 61) IS ALSO AVAILABLE WITH ALL MOTORS ON THIS PAGE. PRICE ADDITION OF \$200.00 APPLIES.

HP-230 V. DC Motor	Thyra Line Model #	Recommended Transformer	Typical Motors Available
3	#185-26 (12.8 amp) \$572.00	5 KVA \$145.00	3 HP 200 to 2200 RPM Frame 225-\$240.00
3	#185-26 (12.8 amp) \$572.00	5 KVA \$145.00	3 HP 400 to 4000 RPM Frame 204-\$340.00
5	#185-216 (36 amp) \$631.00	7 1/2 KVA \$200.00	5 HP 200 to 2200 RPM Frame 254-\$340.00
5	#185-216 (36 amp) \$631.00	7 1/2 KVA \$200.00	5 HP 400 to 4000 RPM Frame 225-\$420.00
7 1/2	#185-216 (36 amp) \$631.00	10 KVA \$250.00	7 1/2 HP 100 to 1400 RPM Frame 324-\$400.00
7 1/2	#185-216 (36 amp) \$631.00	10 KVA \$250.00	7 1/2 HP 200 to 2200 RPM Frame 284-\$465.00



# PRINTED MOTORS PLUS HELLER SPEED CONTROL



Now, for the first time, a unique motor control system adds precise speed control to the versatility of the compact PMI Printed Motor. In a single Heller/Printed Motor system, you are afforded a controlled speed range wide enough for virtually every application.

The precision-built printed motor eliminates the iron rotor and coils found in ordinary motors. Instead, the printed motor features a thin, disc-type armature made of sturdy epoxy-glass on which conductors are printed. This unique design makes the armature inductance negligible, thereby greatly extending motor life under start-stop conditions by elimination of sparking damage to the commutator and brushes. The motor is reversible up to several hundred times a second.

The uninsulated conductor pattern of the thin, flat armature produces broad cooling surfaces which allow for high current pulses and, in turn, extremely high pulse torque values.

And because the flat rotor has conductors printed directly on it, no separate commutator is needed. The epoxy-glass armature contains about 100 commutator segments, eliminating cogging even at extremely low speeds. Minimal cogging permits a speed drive, allowing you to use the motor in a variety of situations, adapting it to new functions as they arise.

This Heller Controller-Printed Motor System provides a stepless full range of speeds from 10 to 3300 RPM, **without motor cogging**. Minimal cogging also results in unusually smooth torque over the entire speed range—torque so smooth that gearless low speed drives are now possible.

The Heller Controller is a self-regulating solid-state device that converts AC to DC power for the direct-drive Printed Motor. Speed regulation from no load to full load is 7% or better, even with AC line voltage changes of  $\pm 15\%$ .

## PRINTED MOTORS

PRINTED MOTORS, INC.

### MODEL U9

Rated Torque (continuous duty)	12 ounce-inches
Maximum Pulse Torque	
Capability (intermittent)	150 ounce-inches
Armature Inertia (including hub and shaft)	.004 oz.-in.-sec <sup>2</sup>
Armature Inductance	Less than 100 micro-henries
Rated Speed (continuous duty)	3300 RPM
Rated Current for 70°C rise (continuous)	7.0 amps
Maximum Stall Current (continuous)	5 amps
Rated Voltage	12 volts dc
Power Output at 3300 rpm	1/25 H.P.
Magnetic Field	8 pole Alnico
Number of Commutation segments	97
Armature Resistance	.63 ohms
Maximum Friction Torque	1.5 ounce-inches
Weight	3 pounds

PM-9	CONTROL AND CABINET ONLY	\$175.00
PM-9	MOTOR AND CONTROL ONLY	\$240.00

### MODEL U12

Rated Torque (continuous duty)	42.5 ounce-inches
Maximum Pulse Torque	
Capability (intermittent)	375 ounce-inches
Armature Inertia (including hub and shaft)	.018 oz.-in.-sec <sup>2</sup>
Armature Inductance	Less than 100 micro-henries
Rated Speed (continuous duty)	3300 RPM
Rated Current for 70°C rise (continuous)	7.5 amps
Maximum Stall Current (continuous)	6 amps
Rated Voltage	24 volts dc
Power Output at 3300 rpm	1/7 H.P.
Magnetic Field	8 pole Alnico
Number of commutation segments	121
Armature Resistance	.600 ohms
Maximum Friction Torque	2.0 ounce-inches
Weight	6.5 pounds

PM-12	CONTROL AND CABINET ONLY	\$175.00
PM-12	MOTOR AND CONTROL ONLY	\$250.00

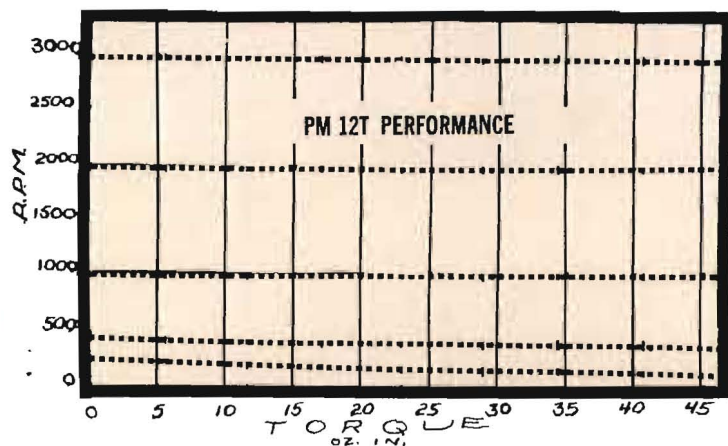
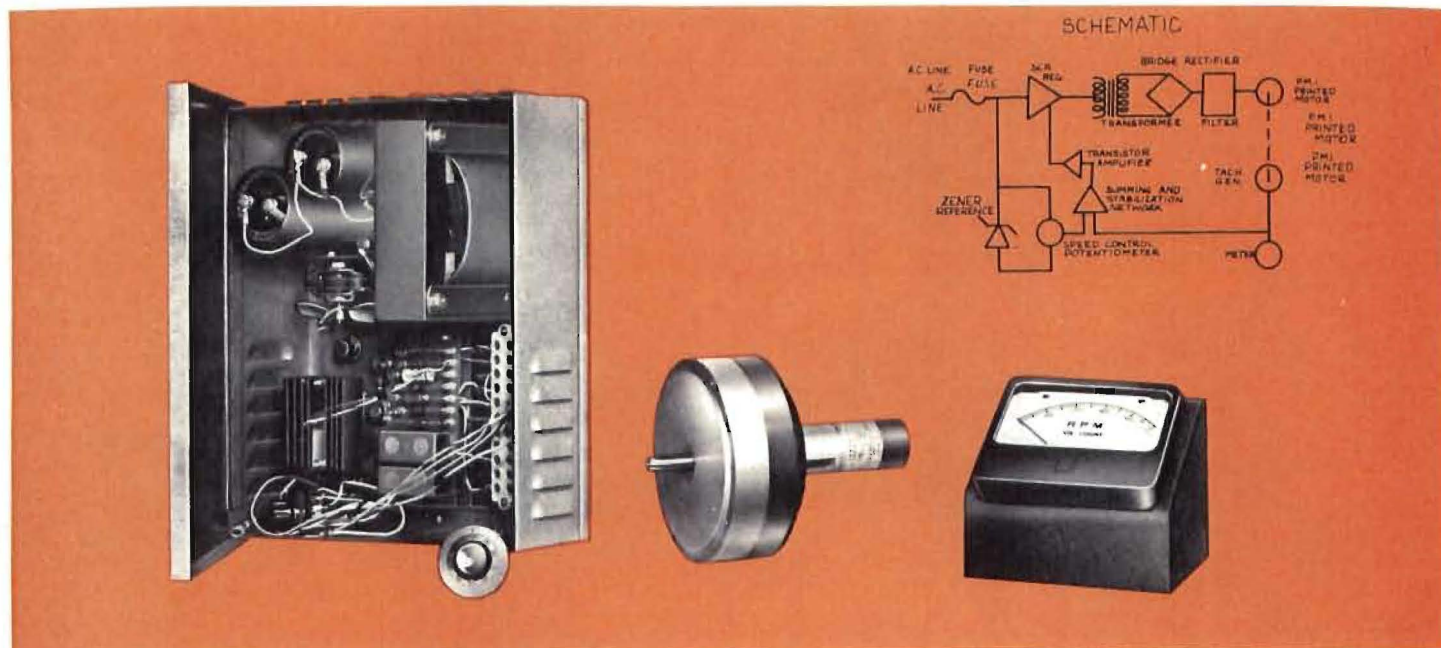
### MODEL 688

Rated Torque (continuous duty)	140 ounce-inches
Maximum Pulse Torque	
Capability (intermittent)	1175 ounce-inches
Armature Inertia (including hub and shaft)	.088 oz.-in.-sec <sup>2</sup>
Armature Inductance	Less than 100 micro-henries
Rated Speed (continuous duty)	2700 RPM
Rated Current for 70°C rise (continuous)	10 amps
Maximum Stall Current (continuous)	8 amps
Rated Voltage	36 volts dc
Power Output at 2700 rpm	3/8 H.P.
Magnetic Field	8 pole Alnico
Number of commutation segments	145
Armature Resistance	.40 ohms
Maximum Friction Torque	8 ounce-inches
Weight	13 pounds

PM-75	CONTROL ONLY, LESS CABINET	\$185.00
PM-75-688	MOTOR AND CONTROL	\$430.00



**NEW HELLER / PRINTED MOTOR**  
THE VARIABLE SPEED DRIVE WITH A 1000 TO 1 SPEED RANGE



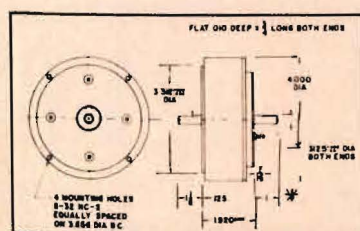
**Characteristics:**

Basically incorporating the PM V9C, V12C, and 668 motors described previously, the addition of a Vis-count M176T2 tachometer-generator allows better than 1% regulation through a 2000 to 1 speed range, with line voltage correction. Overall speed range is 3300 to 1.5 RPM.

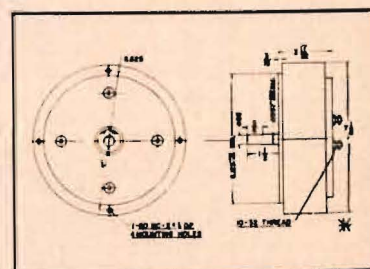
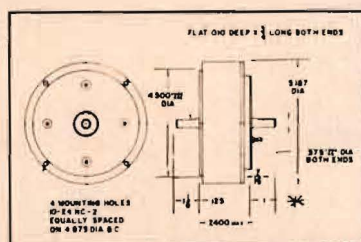
**Operation:**

The PM176T2 tach-generator is mounted on the appropriate PM motor and will signal the PM175T control a voltage that is compared to a standard in the control circuit. Any deviation from the standard automatically and instantly signals the motor to increase or reduce speed. **Now in effect, there is available a variable speed synchronous motor in which the correction of speed occurs within one revolution of the armature.** Input voltage of 115 volt AC single phase is standard.

Rotation: Reversible.



\*add 4" to length to Tachometer

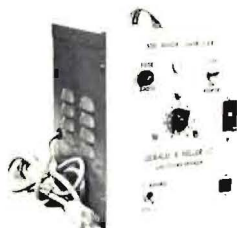
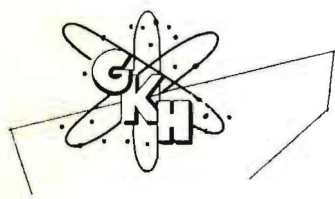


PM-9T	TACHOMETER SYSTEM, MOTOR, AND CONTROL	\$420.00
PM-12T	TACHOMETER SYSTEM, MOTOR, AND CONTROL	\$430.00
PM-75T-668	TACHOMETER SYSTEM, MOTOR, AND CONTROL	\$610.00

**QUANTITY DISCOUNTS AVAILABLE**



## Heller Motor Speed Controllers provide precise, stepless control of motor speed.



Heller Controls are heavy duty, well constructed units designed for demanding laboratory and production applications. They will operate the hundreds of D.C. shunt motors found in this catalog on 115V or 230V alternating current. The designs feature: Reversing, Dynamic Breaking, Line or Armature Fusing, Indicator Light, and all Plug-in Connections (Motor and Control combinations are completely prewired).

- MODEL GT-21 Laboratory stirrer
- MODEL 2T-60 For motors up to 1/50 H.P.
- MODEL S-10 For motors up to 1/20 H.P.
- MODEL S-12 For motors up to 1/8 H.P.
- MODEL CX-25 For motors up to 1/4 H.P.
- MODEL S-30 For motors up to 1/3 H.P.
- MODEL S-47 For motors up to 1/3 H.P.
- MODEL S-50T For motors up to 1/3 H.P. Features tachometer feedback from motor for 1% speed regulation
- MODEL S-250 For motors up to 1 H.P.
- MODEL S-800 For motors up to 2 H.P.
- MODEL PM-75 For Printed Motors up to 3/8 H.P.

## Bodine----3500 Standard Motors to Fit your Requirements, no matter how unique or exacting



Type N. 1/150 to 1/4 hp. 3 1/2", 4 3/4", and 6 1/4" high. Windings available: split phase, 3-phase, shunt, capacitor, synchronous, compound and universal (series wound, including governor controlled).



Type K-2. 1/2000 to 1/500 hp. 2 1/4" high. One of the smallest distributed wound motors manufactured. Synchronous or non-synchronous.



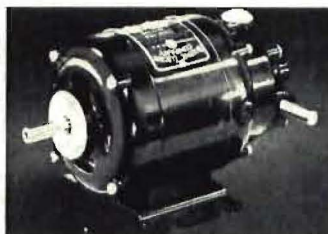
Type K-2 speed reducer motors. 2 1/4" high. Speeds 300 rpm to 0.7 rpm. Torques 1.3 to 120 in./oz. Helical or spur gearing. Synchronous or non-synchronous. Continuous duty.



Single reduction, right angle worm gear reducer to deliver moderate torques (up to 21 in. lbs.). Height, 4 1/4".



Double worm-gear reducer for transmitting high torques (up to 219 in. lbs.) at low speeds. Height, 6 1/4".



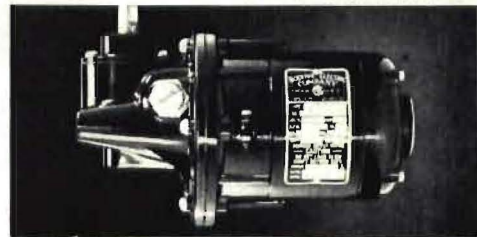
Single or double reduction speed reducers for transmitting low torques (up to 6.5 in. lbs.) over a wide range of speeds. Height, 3 3/4".



Single reduction, right angle worm gear reducers for transmitting substantial torques (up to 73 in. lbs.). Height, 6 1/4".



Single reduction, heavy duty reducer with torques up to 198 in. lbs. Ample reserve for overloads.



Double worm-gear reducer to deliver moderate torques (up to 52 in. lbs.) at low speeds. Height, 4 1/4".